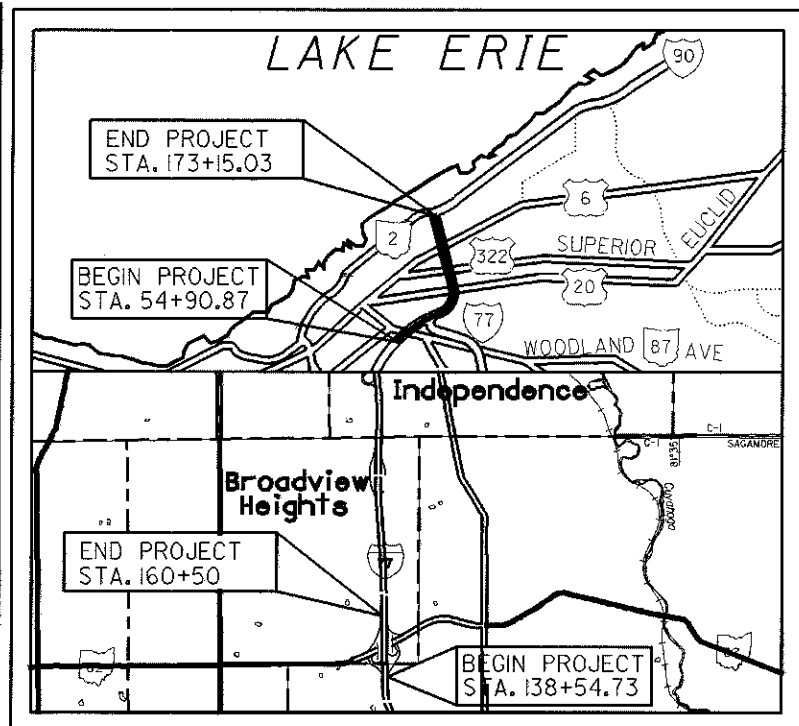


STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

CUY-90-16.22/VAR.

CITY OF BRECKSVILLE
CITY OF BROADVIEW HEIGHTS
CITY OF CLEVELAND
CUYAHOGA COUNTY



LOCATION MAP

LONGITUDE - W 81°40'00" LATITUDE - N 41°30'00"

SCALE IN MILES



PORTION OF IR-90 TO BE IMPROVED _____
STATE & FEDERAL ROUTES _____
OTHER ROADS _____

CUY - IR 90 - 16.22/Various
010047 PID - 20655
Dist 12 2/7/2001

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
CALL 1-800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

PLAN PREPARED BY:
OHIO DEPARTMENT OF
TRANSPORTATION
DISTRICT 12
PRODUCTION

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PROJECT DESCRIPTION:

PROJECT INCLUDES OVERLAYING MAINLINE IR-90 WITH NOVACHIP AND GRINDING AND REPLACING THE EXISTING ASPHALT SURFACE COURSE OF THE RAMPS. THE RAMPS AT S.R. 82 AND IR-77 WILL INCLUDE, MILLING, PAVEMENT REPAIR AND A NOVACHIP OVERLAY.

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE REVISED CODE OF OHIO.

1997 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH IN THE PLANS AND ESTIMATES.

APPROVED *Dave Coyle*
DATE 10-27-00 DISTRICT DEPUTY DIRECTOR

APPROVED *Jordan Proctor*
DATE 11-7-00 DIRECTOR, DEPARTMENT OF TRANSPORTATION

STANDARD CONSTRUCTION DRAWINGS

SUPPLEMENTAL SPECIFICATIONS

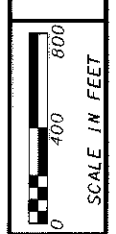
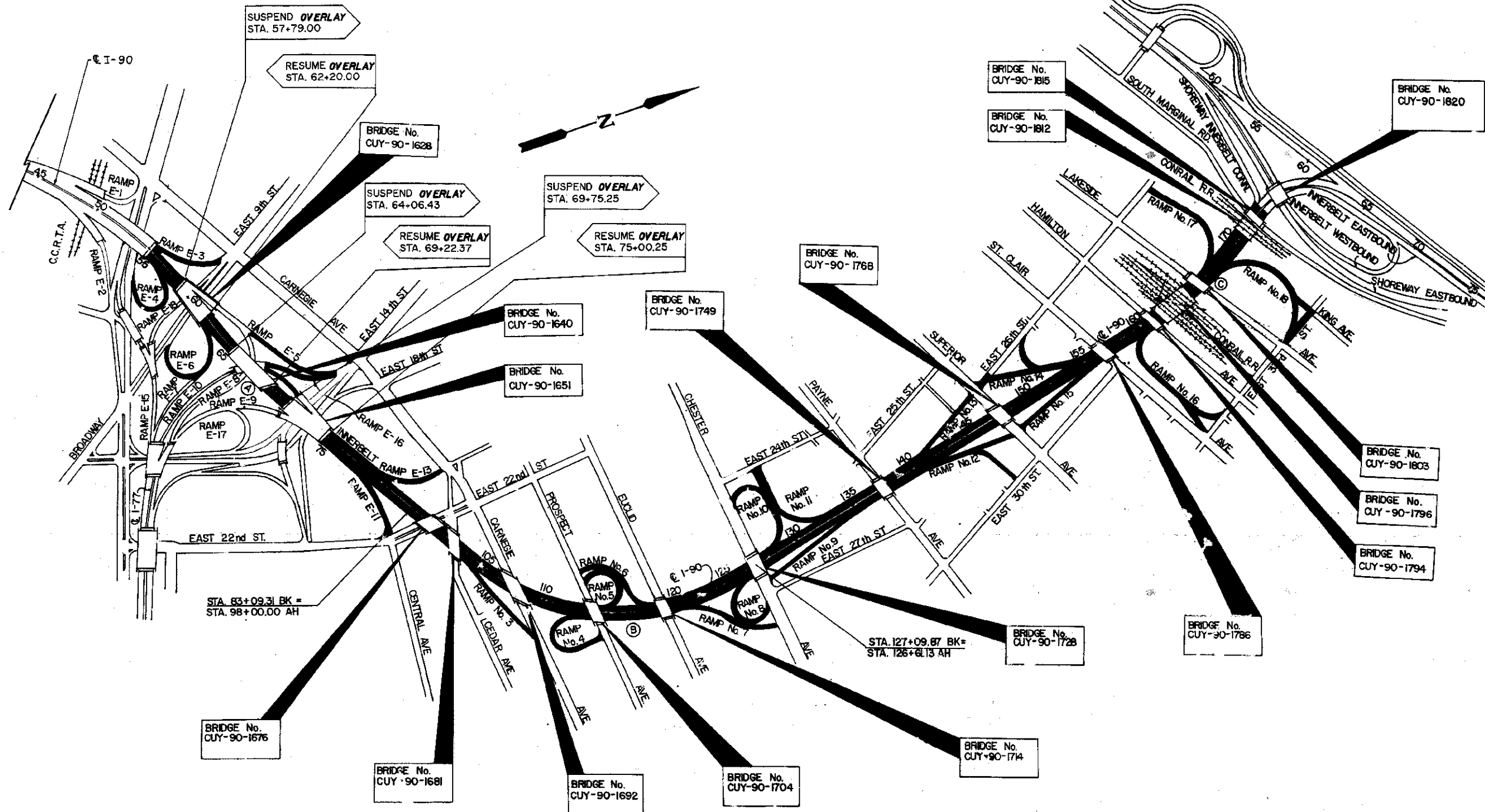
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BP-2.2	7/28/00	TC-65.11M	11/1/95	MT-35.11M	1/30/95	828	7/28/98
BP-2.5	7/28/00	TC-65.12M	11/1/95	MT-95.30M	4/25/94	905	4/1/98
BP-3.1	7/28/00			MT-95.30M	4/25/94	906	5/5/98
BP-7.1	7/28/00	TC-71.10M	9/1/93			906	10/21/98
		TC-72.20M	9/1/93	MT-98.12M	6/24/93	908	3/28/00
				MT-98.13M	6/24/93	932	10/2/96
		TC-82.10M	1/19/99	MT-98.14M	6/24/93		
		TC-82.11M	1/19/99				
				MT-98.15M	6/24/93		
				MT-98.19M	3/1/96		
				MT-99.20M	1/30/95		
				MT-105.10M	4/25/94		
				MT-105.11M	4/25/94		

SPECIAL PROVISIONS

ENGINEERS SEAL:	ENGINEERS SEAL:

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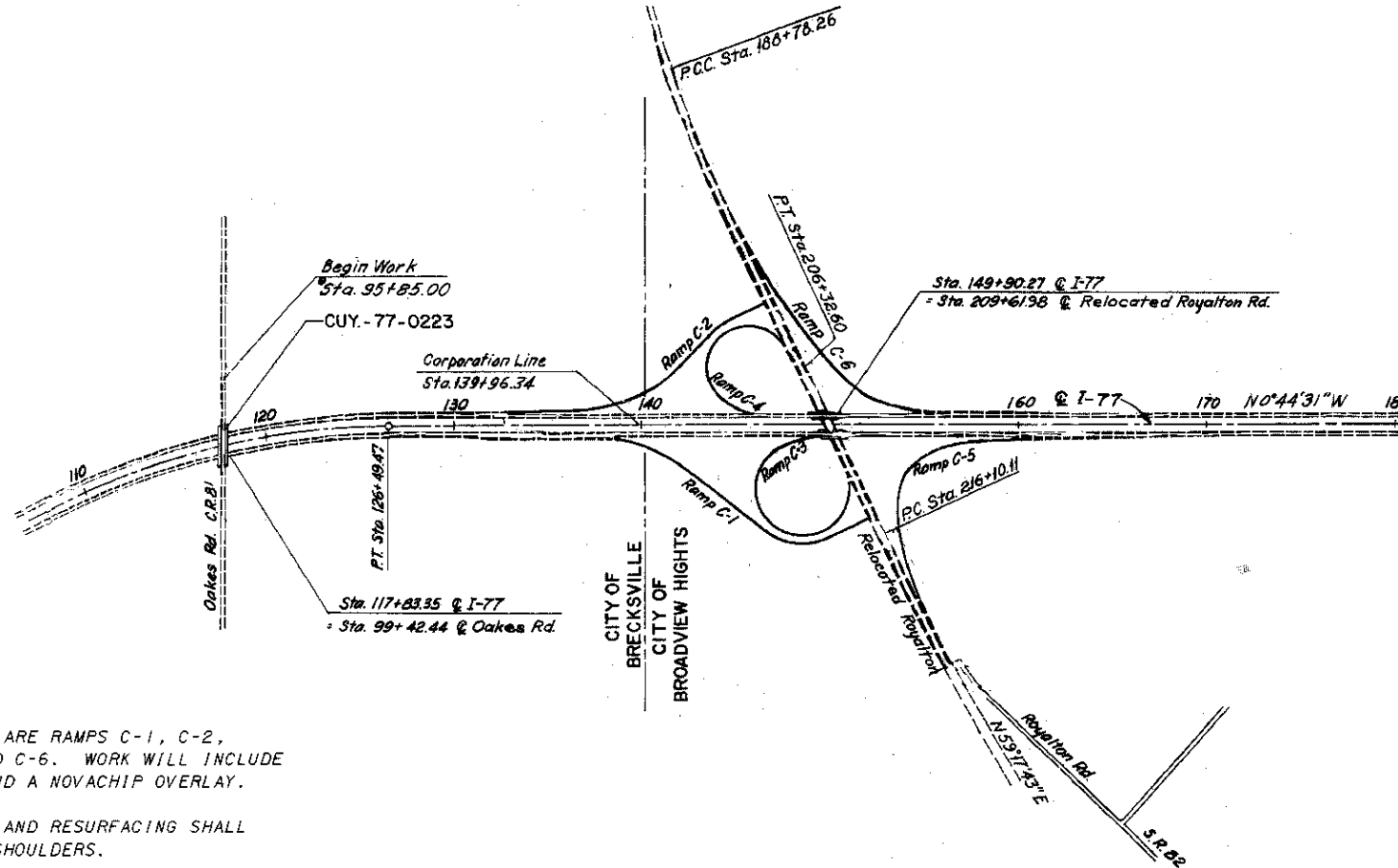
FEDERAL PROJECT NO. 100% STATE
PID NO. 20655
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
CUYAHOGA COUNTY CUY-90-16.22/VAR.
1/54



DRAWN	JRC	REVISED	
CALCULATED	JRC	CHECKED	LGM

SCHEMATIC PLAN
I-90 / INNERBELT FREEWAY

CUYAHOGA COUNTY
CUY-90-16.22/VAR.



AREAS TO BE PAVED ARE RAMPS C-1, C-2, C-3, C-4, C-5, AND C-6. WORK WILL INCLUDE PAVEMENT REPAIR AND A NOVACHIP OVERLAY.

PAVEMENT REPAIRS AND RESURFACING SHALL INCLUDE THE RAMP SHOULDERS.

LIMITING STATIONS FOR THE NOVACHIP OVERLAY ARE SHOWN ON THE PLAN SHEETS.

SCALE IN FEET	0	400	800
CALCULATED	LGM	CHECKED	JRC
DRAWN	LGM	REVISED	

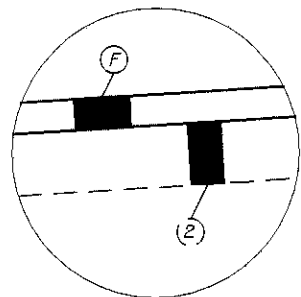
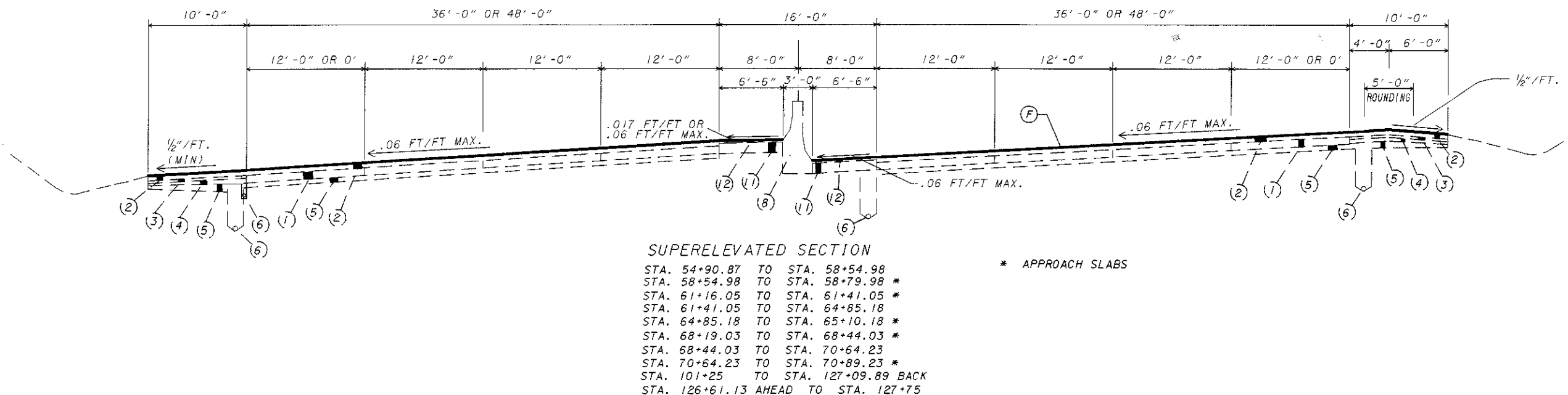
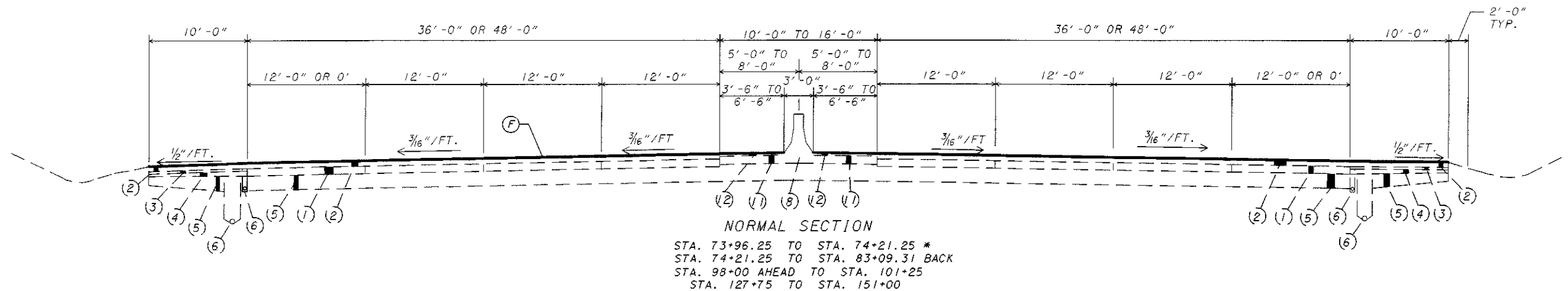
SCHEMATIC PLAN
I-77 / S.R. 82 RAMPS

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

TYPICAL SECTIONS

TYPICAL SECTIONS

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.



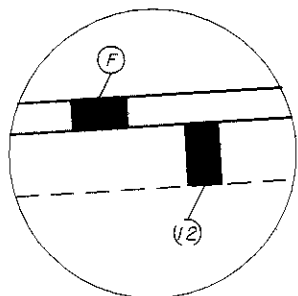
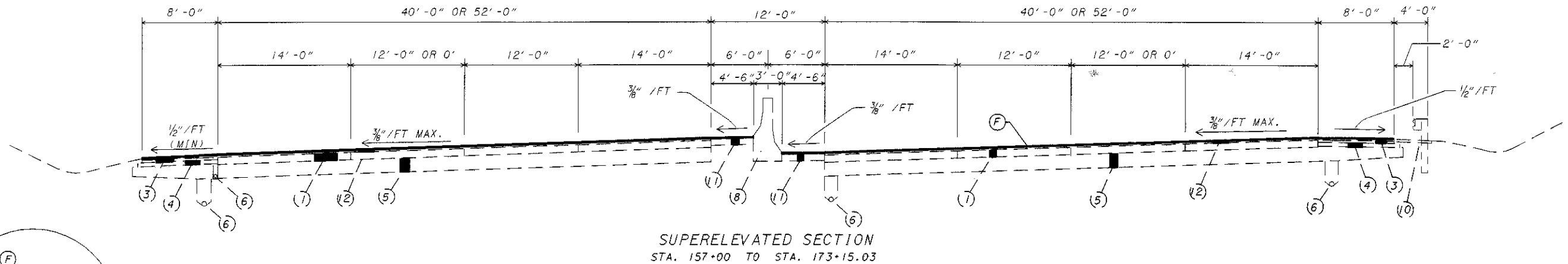
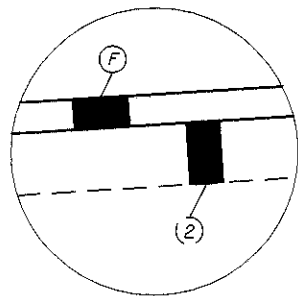
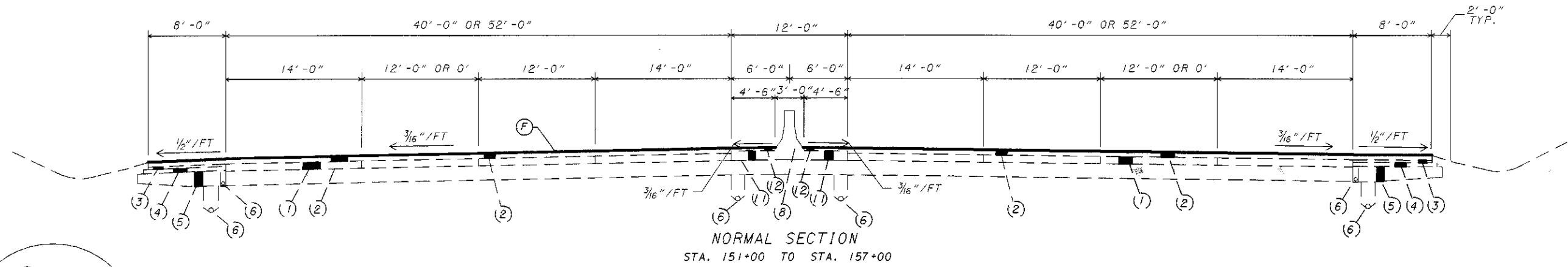
TYPICAL PAVEMENT DETAIL 1R-90

- EXISTING**
- (1) 9" REINFORCED CONCRETE PAVEMENT
 - (2) 4-1/4" EXISTING ASPHALT
 - (3) BITUMINOUS AGGREGATE BASE
 - (4) AGGREGATE BASE
 - (5) SUBBASE, 6" OR 18"
 - (6) UNDERDRAIN
 - (8) CONCRETE BARRIER MEDIAN
 - (9) CURB
 - (10) GUARDRAIL
 - (11) 9" PLAIN CONCRETE PAVEMENT
 - (12) 1-3/4" EXISTING ASPHALT
- (7) NOT USED

- PROPOSED**
- (A) ITEM 202 - WEARING COURSE REMOVED (3"+)
 - (B) ITEM 407 - TACK COAT
 - (C) ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE
 - (D) ITEM 446 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN (1 1/2")
 - (E) ITEM 446 - ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-28 (2")
 - (F) ITEM SPECIAL - NOVACHIP
 - (G) ITEM 617 - COMPACTED AGGREGATE, TYPE A

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TYPICAL SECTIONS



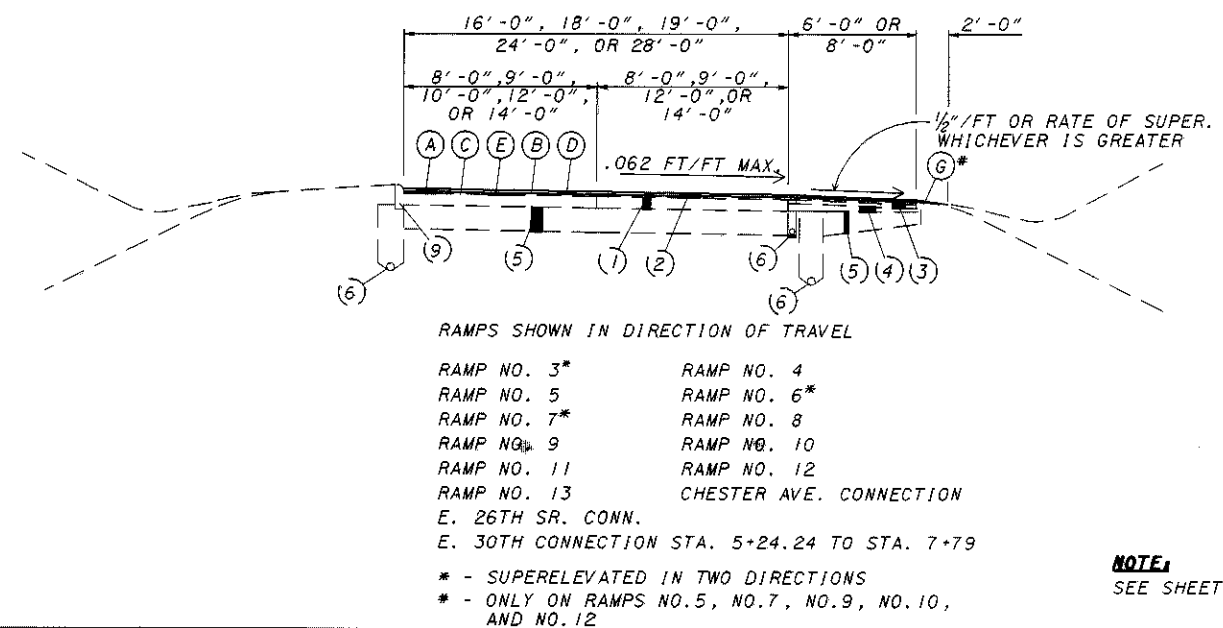
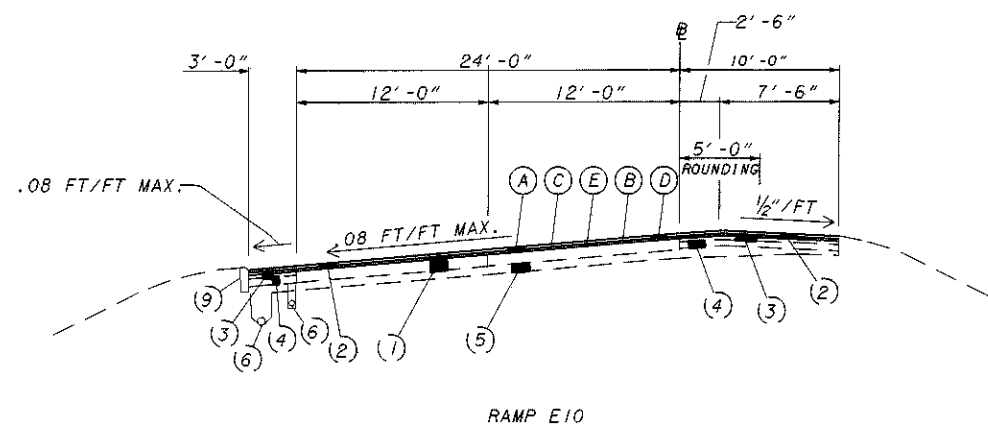
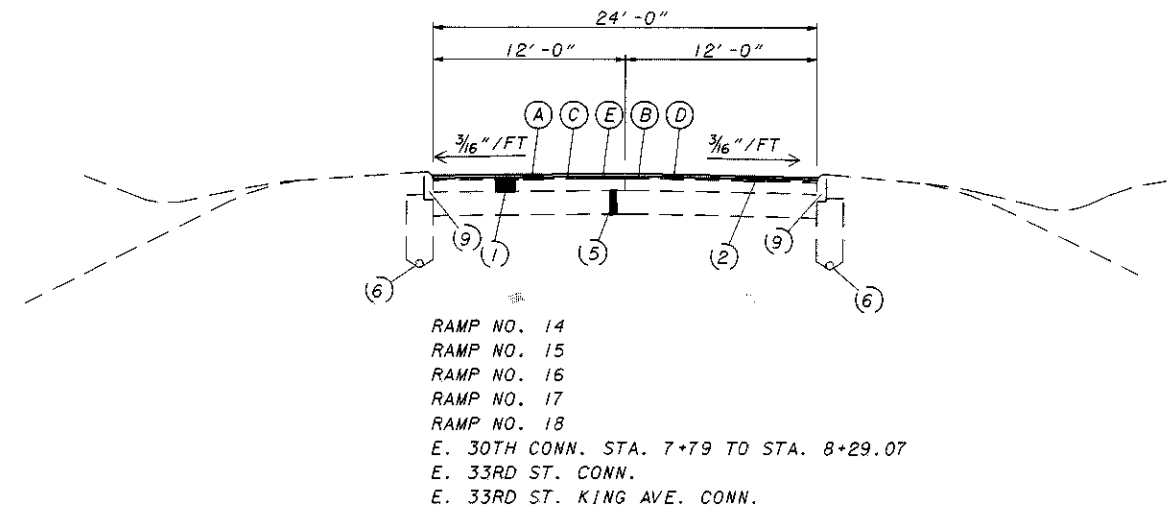
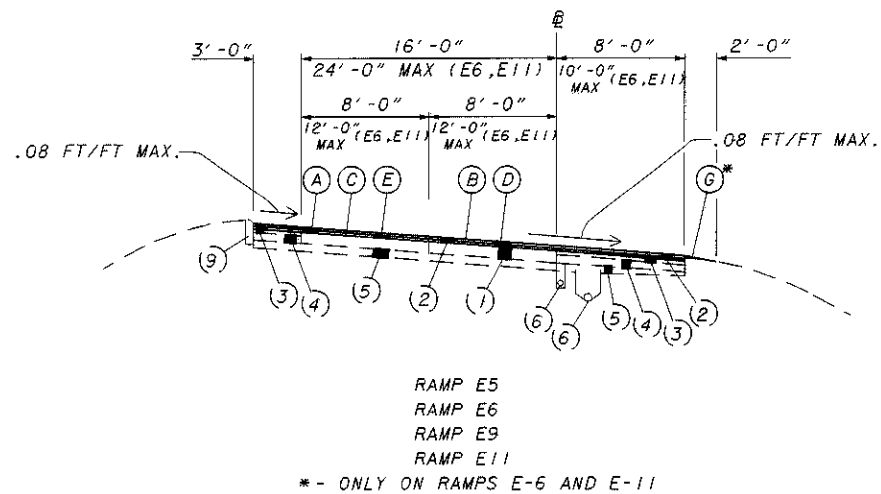
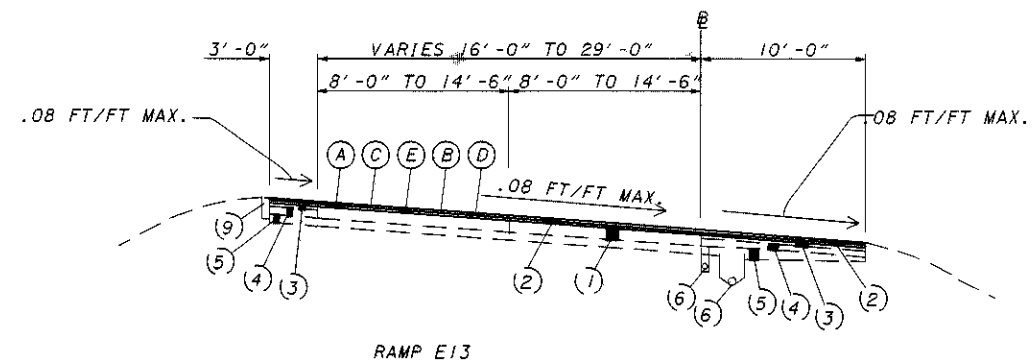
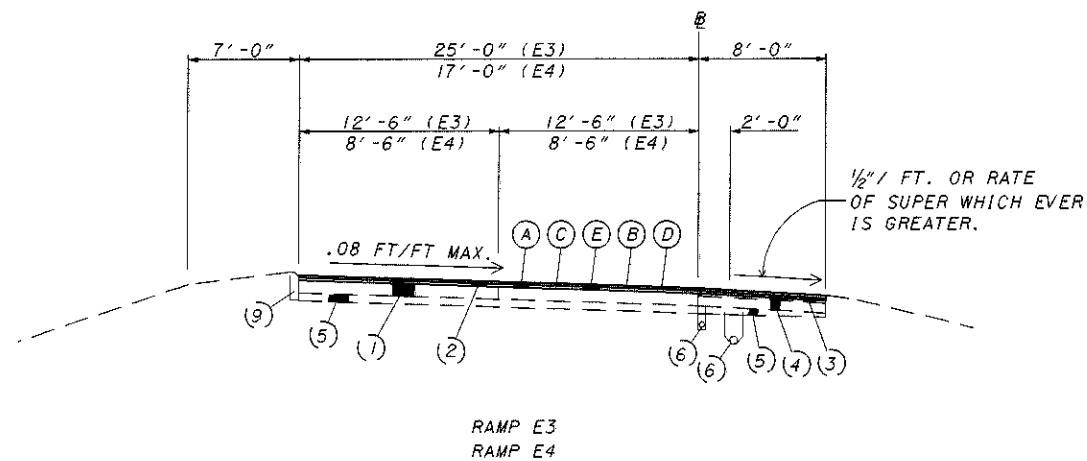
TYPICAL SECTIONS

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

SEE SHEET 4 FOR LEGEND

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TYPICAL SECTIONS



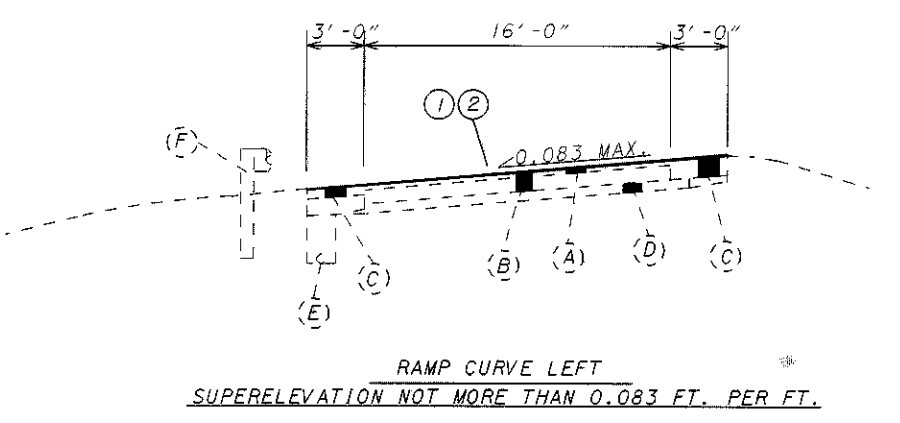
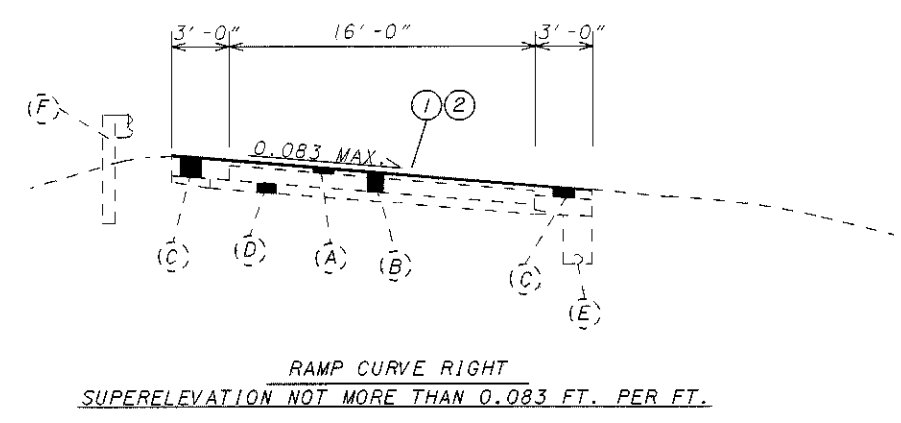
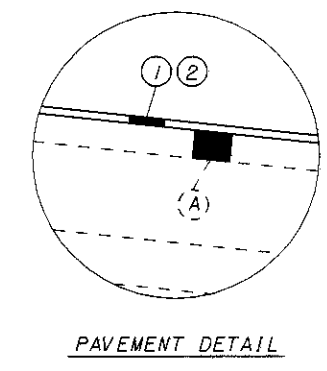
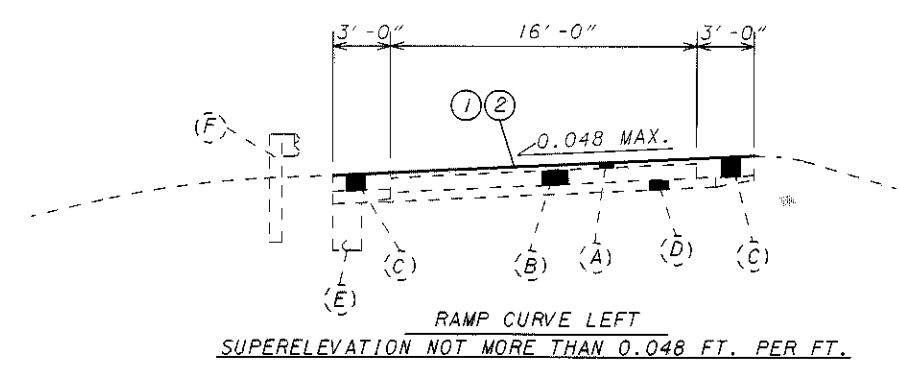
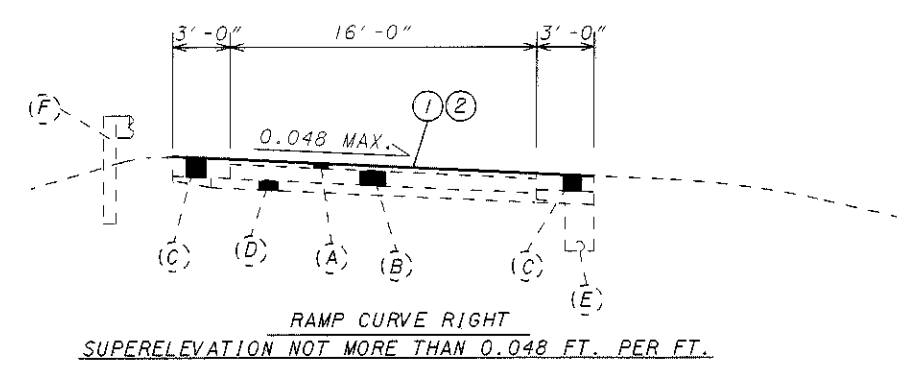
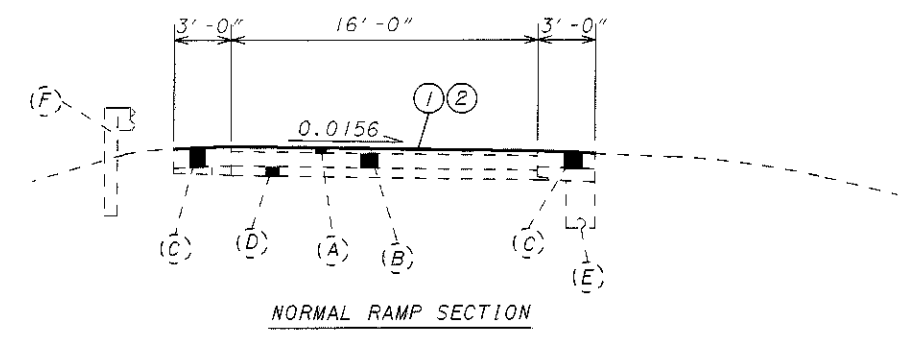
NOTE:
SEE SHEET 4 FOR LEGEND

PROPOSED LEGEND

- ① ITEM 254 - PAVEMENT PLANING, BITUMINOUS, (T-3/4")
- ② ITEM SPECIAL - MISC.: NOVACHIP (T-3/4")

EXISTING LEGEND

- (A) ASPHALT OVERLAY (3 3/4" ±)
- (B) 9" REINFORCED CONCRETE BASE
- (C) BITUMINOUS AGGREGATE BASE
- (D) AGGREGATE BASE
- (E) UNDERDRAIN
- (F) GUARDRAIL



PROJECT DESCRIPTION

PROJECT INCLUDES OVERLAYING MAINLINE IR-90 WITH NOVACHIP AND MILLING AND REPLACING THE EXISTING ASPHALT SURFACE COURSE OF THE RAMPS.

THE RAMPS AT S.R. 82 AND IR-77 WILL INCLUDE MILLING, PAVEMENT REPAIR, AND A NOVACHIP OVERLAY.

UTILITIES

LISTED BELOW ARE THE UTILITIES AND OWNERS LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS. THE OHIO DEPARTMENT OF TRANSPORTATION HAS USED THE BEST AVAILABLE INFORMATION TO DETERMINE THE UTILITY COMPANIES SERVING THIS AREA, BUT CANNOT GUARANTEE THE UTILITY COMPANY LIST IS COMPLETE.

The Illuminating Co. - West
6896 Miller Road
Brecksville, Ohio 44141
Attn: Frank Dibbs
Phone: (440) 546-8748
Fax: (440) 546-8775

Ameritech
13630 Lorain Ave. - 4th Floor
Cleveland, Ohio 44111
Attn: Dick Light
Phone: (216) 476-6142
Fax: (216) 476-6013

Cuyahoga County Sanitary Engineer
6100 West Canal Road
Valley View, Ohio 44125
Attn: Ruth Langsner
Phone: (216) 443-8204
Fax: (216) 443-8236

East Ohio Gas Company
1201 East 55th Street
Cleveland, Ohio 44103
Attn: Sam Mercurio
Phone: (216) 736-6675
Fax: (216) 736-6780

**City of Cleveland
Division of Water**
1201 Lakeside Ave.
Cleveland, Ohio 44114
Attn: Don Trebar
Phone: (216) 664-2444
Fax: (216) 664-2378

**City of Cleveland
Division of Cleveland Public Power (Melp)**
1300 Lakeside Ave.
Cleveland, Ohio 44114
Attn: Dale Turkovich
Phone: (216) 664-4245, Ext. 115
Fax: (216) 664-2777

RIGHT OF WAY

ALL WORK SHALL BE PERFORMED WITHIN THE EXISTING RIGHT OF WAY.

FINAL INSPECTION

WORK WHICH IS UNACCEPTABLE OR BECOMES UNACCEPTABLE PRIOR TO FINAL INSPECTION AS DETERMINED BY THE ENGINEER DUE TO CAUSES SUCH AS, BUT NOT LIMITED TO, IMPROPER PLACEMENT SHALL BE REPAIRED BY A METHOD SUITABLE TO THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

EXISTING TYPICAL SECTIONS

EXISTING TYPICAL SECTIONS HAVE BEEN TAKEN FROM THE RECORDS AND ARE BELIEVED TO REPRESENT THE EXISTING PAVEMENT, BUT THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THE SAME.

FOR FURTHER INFORMATION IN REGARD TO THE EXISTING TYPICAL SECTIONS THE CONTRACTOR SHALL REFER TO THE PREVIOUS CONSTRUCTION PLANS. THESE PLANS MAY BE REVIEWED AT THE OHIO DEPARTMENT OF TRANSPORTATION, DISTRICT TWELVE OFFICE, 5500 TRANSPORTATION BLVD., GARFIELD HEIGHTS, OHIO 44125.

COOPERATION BETWEEN CONTRACTORS

THE CONTRACTOR SHALL COOPERATE AND COORDINATE HIS OPERATIONS WITH THE CONTRACTOR'S ON OTHER PROJECTS THAT MAY BE IN FORCE DURING THE LIFE OF THIS CONTRACT. NO WAIVER OF ANY PROVISIONS OF 105.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS IS INTENDED.

CONTINGENCY QUANTITIES

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER.

CONVERSION OF METRIC STANDARD DRAWINGS

THE METRIC STANDARD DRAWINGS REFERENCED IN THIS PLAN SHALL BE CONVERTED TO ENGLISH UNITS USING THE SI (METRIC) TO ENGLISH CONVERSION FACTORS PROVIDED IN SECTION 109.011 OF THE 1997 CONSTRUCTION AND MATERIALS SPECIFICATIONS. THE APPENDIX OF ASTM E 380 SHALL BE UTILIZED FOR ANY ADDITIONAL CONVERSION FACTORS REQUIRED. CONVERSIONS SHALL BE APPROPRIATELY PRECISE AND SHALL REFLECT STANDARD INDUSTRY ENGLISH VALUES WHERE SUITABLE.

EQUIPMENT AND MATERIAL STORAGE

IN ORDER TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC THE CONTRACTOR'S ATTENTION IS DIRECTED TO 614.03. IN ADDITION THE FOLLOWING PROVISIONS SHALL APPLY:

- 1) ANY REMOVED ITEMS SHALL NOT BE STORED ON THE RIGHT OF WAY FOR MORE THAN THIRTY DAYS.
- 2) THE STORAGE OF EQUIPMENT, MATERIALS, AND VEHICLES WITHIN THE HIGHWAY RIGHT OF WAY WILL BE PERMITTED. THE NUMBER OF AREAS AND EXACT LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
- 3) ALL DISTURBED AREAS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE STATE.

ALIGNMENT AND PROFILE

THE PROPOSED PAVEMENT RESURFACING SHALL FOLLOW THE ALIGNMENT AND PROFILE OF THE EXISTING PAVEMENT. THE PROPOSED NOVACHIP OVERLAY SHALL HAVE A UNIFORM THICKNESS AND WILL BE APPROXIMATELY 3/4" ABOVE THAT OF THE EXISTING PAVEMENT ON IR-90.

ITEM 413 - SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS

PRIOR TO BEGINNING PLANING OPERATIONS, THE CONTRACTOR SHALL MARK THE LOCATIONS OF EXISTING SAWED AND SEALED JOINTS ON BOTH THE INSIDE AND THE OUTSIDE EDGES OF THE RAMP PAVEMENT. THE CONTRACTOR MUST SAW NEW JOINTS IN THE FINAL SURFACE COURSE AT THE SAME LOCATION AS THE EXISTING TRANSVERSE PAVEMENT JOINTS.

THE PROPOSED SAWING AND SEALING SHALL BE PERFORMED WITHIN TWO (2) DAYS OF THE PLACEMENT OF THE FINAL SURFACE COURSE, WITHIN THE LANE CLOSURE RESTRICTIONS LISTED ELSEWHERE IN THIS PLAN. THE CONTRACTOR SHALL NOT BEGIN PLANING OPERATIONS ADJACENT TO THE NEW SURFACE COURSE ASPHALT PRIOR TO COMPLETING THE SAWING AND SEALING OPERATION. THE CONTRACTOR SHALL

HAVE SUFFICIENT EQUIPMENT, MATERIALS, AND LABOR ON SITE TO KEEP UP WITH THE ASPHALT PRODUCTION.

THE CONTRACTOR SHALL NOTE THE TYPE OF SURFACE COURSE ASPHALT PROPOSED IN THIS PROJECT. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY EXTRA EFFORT/WORK REQUIRED TO SAW THROUGH THE PROPOSED ASPHALT SURFACE COURSE.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED TO PERFORM THIS ITEM OF WORK:

ITEM 413	SAWING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS	5709	LIN. FT.
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ITEM 604 - MANHOLE ADJUSTED TO GRADE, AS PER PLAN

THIS ITEM SHALL BE USED TO REPAIR EXISTING MANHOLES LOCATED WITHIN NORMALLY TRAVELED LANES PER SECTION 604 OF THE CMS. THE LOCATION AND NUMBER OF THESE REPAIRS SHALL BE DETERMINED BY A VISUAL INSPECTION PERFORMED BY THE PROJECT ENGINEER. ALL TRAFFIC CONTROL WORK REQUIRED TO SAFELY INSPECT THE EXISTING MANHOLES (CONCRETE RINGS AND CASTINGS) SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614-MAINTAINING TRAFFIC.

IN ADDITION TO THE REQUIREMENTS OF SECTION 604 OF THE CMS, THE REMOVAL AND REPLACEMENT OF THE EXISTING CONCRETE BOX OUT AROUND THE MANHOLE CASTING PER SHEET 54, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THIS ITEM. THE CONCRETE BOX OUT SHALL BE REPLACED TO THE FINISHED ROADWAY ELEVATION. THE CONTRACTOR SHALL USE CLASS FS CONCRETE IN ORDER TO MEET THE MAINTENANCE OF TRAFFIC REQUIREMENTS LISTED ELSEWHERE IN THIS PLAN. IF THE ENGINEER DIRECTS THE CONTRACTOR TO REPLACE THE EXISTING CASTING, THE CONTRACTOR MUST HAVE THE REPLACEMENT ON SITE PRIOR TO BEGINNING WORK ON THE MANHOLE. THE COST OF THE NEW CASTING SHALL BE PAID UNDER ITEM SPECIAL- MISCELLANEOUS METAL.

NO ADJUSTING RINGS SHALL BE PERMITTED AND NO ASPHALT OR NOVACHIP SHALL BE PLACED OVER THE CONCRETE BOX OUT.

THE UNIT PRICE BID FOR THIS ITEM SHALL INCLUDE ALL OF THE EQUIPMENT, MATERIALS, AND LABOR REQUIRED TO COMPLETE THE ABOVE NOTED WORK. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY:

ITEM 604	MANHOLE ADJUSTED TO GRADE, AS PER PLAN	29	EACH
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CASTINGS ADJUSTED TO GRADE

ALL CASTINGS SHALL BE ADJUSTED TO THE FINISHED ROADWAY ELEVATION BY THE CONTRACTOR. THE TIME BETWEEN ADJUSTING THE CASTINGS AND RESURFACING SHALL BE KEPT TO AN ABSOLUTE MINIMUM. NO ADJUSTING RINGS SHALL BE PERMITTED. THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 604	MONUMENT BOX ADJUSTED TO GRADE, AS PER PLAN	3	EACH
ITEM 604	CATCH BASIN ADJUSTED TO GRADE, AS PER PLAN	7	EACH
ITEM 604	INLET ADJUSTED TO GRADE, AS PER PLAN	3	EACH
ITEM 638	VALVE BOX ADJUSTED TO GRADE, AS PER PLAN	8	EACH

GENERAL NOTES

CUY-90-16.22/VAR.

ITEM 604 - CATCH BASINS OR INLETS RECONSTRUCTED TO GRADE

THE CONTRACTOR AND ENGINEER SHALL FIELD CHECK ALL EXISTING CATCH BASINS OR INLETS LOCATED WITHIN THE LIMITS OF THE PROJECT. ANY CATCH BASIN OR INLET FOUND THAT EXHIBITS SUBSTANTIAL DETERIORATION AND REQUIRES MORE WORK THAN IS SPECIFIED UNDER CASTINGS ADJUSTED TO GRADE, SHALL BE RECONSTRUCTED TO FINISHED GRADE AS DIRECTED BY THE ENGINEER.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 604	CATCH BASIN, RECONSTRUCTED TO GRADE	<u>2</u>	EACH
ITEM 604	INLET, RECONSTRUCTED TO GRADE	<u>2</u>	EACH

ITEM 604 - MANHOLE RECONSTRUCTED TO GRADE, AS PER PLAN

THIS ITEM SHALL BE USED TO REPAIR EXISTING MANHOLES LOCATED WITHIN NORMALLY TRAVELED LANES PER SECTION 604 OF THE CMS. THE LOCATION AND NUMBER OF THESE REPAIRS SHALL BE DETERMINED BY A VISUAL INSPECTION PERFORMED BY THE PROJECT ENGINEER. ANY MANHOLE FOUND THAT EXHIBITS SUBSTANTIAL DETERIORATION AND REQUIRES MORE WORK THAN IS SPECIFIED UNDER MANHOLE ADJUSTED TO GRADE, AS PER PLAN SHALL BE RECONSTRUCTED TO FINISHED GRADE AS DIRECTED BY THE ENGINEER. ALL TRAFFIC CONTROL WORK REQUIRED TO SAFELY INSPECT THE EXISTING MANHOLES (CONCRETE RINGS AND CASTINGS) SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614-MAINTAINING TRAFFIC.

IN ADDITION TO THE REQUIREMENTS OF SECTION 604 OF THE CMS, THE REMOVAL AND REPLACEMENT OF THE EXISTING CONCRETE BOX OUT AROUND THE MANHOLE CASTING PER SHEET 54, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THIS ITEM. THE CONCRETE ENCASUREMENT SHALL BE REPLACED TO THE FINISHED ROADWAY ELEVATION. THE CONTRACTOR SHALL USE CLASS FS CONCRETE IN ORDER TO MEET THE MAINTENANCE OF TRAFFIC REQUIREMENTS LISTED ELSEWHERE IN THIS PLAN. IF THE ENGINEER DIRECTS THE CONTRACTOR TO REPLACE THE EXISTING CASTING, THE CONTRACTOR MUST HAVE THE REPLACEMENT ON SITE PRIOR TO BEGINNING WORK ON THE MANHOLE. THE COST OF THE NEW CASTING SHALL BE PAID UNDER ITEM SPECIAL- MISCELLANEOUS METAL.

NO ASPHALT OR NOVACHIP SHALL BE PLACED OVER THE CONCRETE RINGS.

THE UNIT PRICE BID FOR THIS ITEM SHALL INCLUDE ALL OF THE EQUIPMENT, MATERIALS, AND LABOR REQUIRED TO COMPLETE THE ABOVE NOTED WORK. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY:

ITEM 604	MANHOLE RECONSTRUCTED TO GRADE, AS PER PLAN	<u>2</u>	EACH
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ITEM SPECIAL - MISCELLANEOUS METAL

THIS ITEM SHALL BE USED TO REPLACE EXISTING DAMAGED BOLTED DOWN MANHOLE CASTINGS LOCATED WITHIN THE NORMALLY TRAVELED PAVEMENT AS DIRECTED BY THE ENGINEER. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE THE CASTING OF THE REQUIRED TYPE, SIZE, AND STRENGTH FOR THE PARTICULAR STRUCTURE IN QUESTION.

MATERIALS FURNISHED FOR THIS ITEM SHALL BE: FOUR (4) EQUALLY SPACED HALF-INCH (1/2") STAINLESS STEEL HEX CAP SCREWS CONFORMING TO ASTM F-593, ALLOY GROUP I. COUNTERSINKS, HOLES, THREADING AND PLACEMENT SHALL BE DONE IN ACCORDANCE WITH THE CASTING MANUFACTURES RECOMMENDATIONS AND METHODS.

ALL CASTINGS SHALL CONFORM TO THE REQUIREMENTS OF ITEM 604. THE CONTRACTOR IS CAUTIONED TO USE EXTREME CARE IN THE REMOVAL, STORAGE, AND REPLACEMENT OF ALL CASTINGS. ANY CASTINGS DAMAGED BY THE NEGLIGENCE OF THE CONTRACTOR, AS DETERMINED BY THE ENGINEER, SHALL BE REPLACED WITH THE PROPER NEW CASTING BY THE CONTRACTOR AT NO EXPENSE TO THE STATE.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED TO PERFORM THIS ITEM OF WORK:

ITEM SPECIAL	MISCELLANEOUS METAL	<u>8000</u>	LBS.
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ITEM 254 - PATCHING PLANED SURFACE

THIS ITEM OF WORK SHALL INCLUDE PATCHING PLANED SURFACES AFTER THE ASPHALT PAVEMENT HAS BEEN PLANED.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:

ITEM 254	PATCHING PLANED SURFACE	<u>1598</u>	SQ. YD.
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ITEM 407 - TACK COAT

THE RATE OF APPLICATION OF THE 407 - TACK COAT SHALL BE SUBJECT TO ADJUSTMENTS AS DIRECTED BY THE ENGINEER. PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF 0.10 GAL/SQ.YD. FOR ESTIMATION PURPOSES ONLY.

ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE

THE RATE OF APPLICATION OF THE 407 TACK COAT FOR INTERMEDIATE COURSE SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. PLAN QUANTITIES INDICATE AN AVERAGE APPLICATION RATE OF 0.05 GALLONS PER SQUARE YARD OF TACK COAT FOR INTERMEDIATE COURSE FOR ESTIMATING PURPOSES ONLY.

ITEM 253 - PAVEMENT REPAIR

AN ESTIMATED QUANTITY HAS BEEN PROVIDED AND SHALL BE USED AS DIRECTED BY THE ENGINEER TO REPAIR THE MAINLINE, RAMPS, AND SHOULDER PAVEMENT.

DEPTH OF REMOVAL SHALL TYPICALLY BE 3 IN. UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE INTENT OF THIS ITEM OF WORK IS TO REPAIR SEVERE OR DEEP POTHoles, LOW AREAS AND AREAS WITH LOOSE OR MISSING ASPHALT. AREAS WHICH HAVE EXTENSIVE CRACKING BUT ARE STRUCTURALLY SOUND SHALL NOT USE THIS ITEM.

THE FOLLOWING CONTINGENCY QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 253	PAVEMENT REPAIR	<u>765</u>	SQ. YD.
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ITEM 446 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN

THE GRADATION FOR THIS ITEM SHALL BE AS PER 441.02, TABLE A, TYPE 1, SURFACE MEDIUM. ALL OTHER SPECIFICATIONS SHALL BE AS TYPE 1H. COARSE AGGREGATE FOR THIS ITEM SHALL BE LIMITED TO AIR COOLED BLAST FURNACE SLAG OR LIMESTONE.

ITEM 202 - RAISED PAVEMENT MARKERS REMOVED FOR STORAGE, AS PER PLAN

RAISED PAVEMENT MARKERS SHALL BE REMOVED FROM THE ROADWAY IN A MANNER THAT PREVENTS DAMAGE TO THE CASTINGS. REMOVED MARKERS SHALL BE COLLECTED, STORED IN 55 GALLON DRUMS (WITH AMOUNT CLEARLY MARKED) AND THEN DELIVERED TO THE ODOT WARRENSVILLE YARD, 25609 EMERY RD., WARRENSVILLE HTS., OHIO 44128 (SR 175 AT INTERSECTION OF I-271 AND EMERY RD.), BY THE CONTRACTOR, AS DIRECTED BY THE ENGINEER. THE PROJECT ENGINEER SHALL GIVE THE WARRENSVILLE TRAFFIC DEPARTMENT (292-5801) 48 HOUR NOTICE PRIOR TO ANY DELIVERIES. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR FURNISHING ALL NECESSARY TRANSFER/RECEIVING DOCUMENTATION TO THE YARD. ALL COSTS ASSOCIATED WITH THE REMOVAL, STORAGE AND DELIVERY OF THESE MARKERS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 202 - RAISED PAVEMENT MARKERS REMOVED FOR STORAGE, AS PER PLAN.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED THROUGHOUT THIS PROJECT:

ITEM 202	RAISED PAVEMENT MARKERS REMOVED FOR STORAGE, AS PER PLAN	<u>1151</u>	EACH
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RAISED PAVEMENT MARKERS

MATERIALS SUPPLIED BY THE DEPARTMENT:

FOR THIS PROJECT, THE RPM CASTINGS SUPPLIED BY O.D.O.T. WILL COME WITH REFLECTORS ATTACHED.

ALL MATERIALS ARE TO BE CONTRACTOR FURNISHED, EXCEPT THAT THE DEPARTMENT SHALL SUPPLY RPM MATERIALS IN THE QUANTITIES SHOWN HEREIN TO THE CONTRACTOR. PAY ITEMS FOR THE DEPARTMENT SUPPLIED MATERIALS SHALL BE INDICATED AS "INSTALLATION ONLY". THE TYPE OF DEPARTMENT SUPPLIED MATERIAL SHALL BE RAISED PAVEMENT MARKER CASTINGS.

THE CONTRACTOR SHALL PICK UP THE DEPARTMENT SUPPLIED RPM MATERIALS AT THE OPI WAREHOUSE IN COLUMBUS, OHIO.

THE CONTRACTOR SHALL PICK UP DEPARTMENT SUPPLIED RPM MATERIALS AT THE SPECIFIED LOCATION(S) FOR TRANSPORT TO THE WORK SITE OR TO THE CONTRACTOR'S STORAGE FACILITY. THE RECYCLED RAISED PAVEMENT MARKER (RPM) AUTHORIZATION FORM IS TO BE SIGNED BY THE DISTRICT CONSTRUCTION ENGINEER PRIOR TO PICK UP OF THE RPMs. THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND/OR THE PARTIES LISTED ON THE AUTHORIZATION FORM IN WRITING AT LEAST FIVE (5) CALENDAR DAYS PRIOR TO PICK UP OF THE DEPARTMENT SUPPLIED MATERIALS. THE CONTRACTOR SHALL STORE THE RPMs WITHOUT DAMAGE OR CONTAMINATION WITH FOREIGN MATTER. A DEDUCTION IN THE AMOUNT OF THE ACTUAL COST TO THE DEPARTMENT SHALL BE MADE FOR MATERIALS DAMAGED BY THE CONTRACTOR OR FOR CASTINGS RECEIVED BY THE CONTRACTOR WHICH WERE NOT INSTALLED AND WERE NOT RETURNED TO THE DEPARTMENT.

RETURN OF NON-PERFORMED RAISED PAVEMENT MARKER MATERIALS SUPPLIED BY THE DEPARTMENT

RAISED PAVEMENT MARKER MATERIALS SUPPLIED BY THE DEPARTMENT, THAT ARE NON-PERFORMED SHALL BE CAREFULLY REPACKED OR PACKED IN THE BOXES IN THE SAME STYLE AND QUANTITY AS ORIGINALLY RECEIVED FROM THE DEPARTMENT. CASTING STYLES SHALL NOT BE MIXED WITHIN ANY ONE CONTAINER. THE CONTRACTOR SHALL CLEARLY MARK ON THE OUTSIDE OF EACH CONTAINER THE STYLE OF CASTING. BOXES SHALL BE PLACED ON SKIDS OR PALLETS IN THE SAME STYLE (LOW PROFILE OR CONVENTIONAL, REFLECTORISED OR NON REFLECTORISED) AND NO MORE THAN 420 RPMs (OR 21 BOXES) ON ONE SKID.

ONLY USE THE BOXES SUPPLIED BY THE RAISED PAVEMENT MARKER RECYCLER. BOXES MUST BE MARKED WITH THE RECYCLER'S PART OR CATALOG NUMBER AND THE PROJECT NUMBER. THE RECYCLER'S CATALOG OR PART NUMBERS MAY BE OBTAINED FROM THE OFFICE OF TRAFFIC ENGINEERING IN COLUMBUS, OHIO OR FROM THE RECYCLER. BOXES NOT MARKED WITH THE PROPER RECYCLER'S CATALOG OR PART NUMBERS, AND THE DEPARTMENT'S PROJECT NUMBER WILL NOT BE ACCEPTED AT THE RECYCLER'S WAREHOUSE. NON PERFORMED MATERIALS WILL BE RETURNED TO THE LOCATION AS SPECIFIED BY THE DISTRICT CONSTRUCTION ENGINEER WITHIN 30 DAYS OF THE COMPLETION OF THE PROJECT.

THE ABOVE WORK INCLUDING ALL LABOR, EQUIPMENT AND MATERIAL NEEDED TO PERFORM THE WORK, SHALL BE CONSIDERED INCIDENTAL TO THE RESPECTIVE PAY ITEM.

IF THE DEPARTMENT HAS TO REPACKAGE THE RPMs CORRECTLY, THE CONTRACTOR WILL BE ASSESSED THE ACTUAL COST FOR REPACKAGING THE MATERIALS BY THE DEPARTMENT'S FORCES.

LOADING OF MATERIALS SUPPLIED BY THE DEPARTMENT AT THE RECYCLER'S WAREHOUSE

TRUCKS SHALL HAVE A LOADING HEIGHT OF 48 INCHES AND BE ABLE TO BACK UP FLUSH TO THE LOADING DOCK.

TRUCKS SHALL NOT HAVE ANY OBSTRUCTIONS OR PROTRUSIONS THAT PREVENT THE LOADING BY A STANDARD FORKLIFT OR LIFT TRUCK.

SEMI TRUCKS OR 20 FOOT COMMERCIAL TRUCKS ARE THE MOST APPROPRIATE TRUCKS FOR LOADS IN EXCESS OF 4 PALLETS (ONE PALLET = 21 BOXES = 2100 LBS).

STAKE BODY TRUCKS ARE APPROPRIATE TO LOAD LESS THAN 4 PALLETS, PROVIDED THE TRUCK IS RATED FOR THE LOAD AND THE LOAD CAN BE SAFELY SECURED FOR TRANSPORT BY CHAINING OR STRAPPING DOWN AS NEEDED.

PICKUP TRUCKS ARE APPROPRIATE FOR LOADS OF APPROXIMATELY ONE PALLET, PROVIDED THE PICKUP TRUCK IS RATED FOR THE LOAD AND THE LOAD CAN BE SAFELY SECURED FOR TRANSPORT.

DUMP TRUCKS, TILT BED TRUCKS, AND NON COMMERCIAL MOVING VANS WILL NOT BE LOADED BY THE RECYCLERS WAREHOUSE.

THE WAREHOUSE SUPERVISOR WILL REFUSE TO LOAD ANY TRUCK THAT IS UNSAFE TO LOAD OR UNSUITABLE FOR THE LOAD BEING PLACED ON THE TRUCK.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY. THE CONTRACTOR SHALL INSTALL RECYCLED RAISED PAVEMENT MARKERS WITH PRISMATIC REFLECTORS:

ITEM 621 RAISED PAVEMENT MARKER, INSTALLATION ONLY **1177** EACH

ENTRANCE AND EXIT MARKINGS

THE ENTRANCE AND EXIT PAVEMENT MARKINGS SHALL BE LOCATED AND INSTALLED AS PER STANDARD CONSTRUCTION DRAWING TC-72.20. PLAN DETAILS SHOWING GORE LOCATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE TO PERFORM AS MANY MEASUREMENTS AS NEEDED TO DETERMINE THE CORRECT LOCATION OF THE MARKINGS.

BUTT JOINTS

THE BUTT JOINT LOCATION MAY BE ADJUSTED BY THE PROJECT ENGINEER TO THE VISIBLE CHANGE IN SURFACE COURSE ASPHALT.

PERMANENT PAVEMENT MARKINGS

PRIOR TO ANY PLANING AND PAVING OPERATIONS, THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A FIELD SURVEY OF THE EXISTING PERMANENT MARKINGS. IT IS THE INTENT OF THIS PLAN TO REPLACE THE PAVEMENT MARKINGS IN THE SAME LOCATION AS THE EXISTING PAVEMENT MARKINGS. ANY STAKING OR MARKING REQUIRED TO ESTABLISH CONTROL POINTS TO ENSURE THAT EXISTING MARKINGS ARE ACCURATELY PLACED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR ALL PERMANENT MARKING LOCATIONS AND LAYOUTS SHALL BE VERIFIED WITH THE ENGINEER PRIOR TO THE ACTUAL INSTALLATION.

CURB RAMP REPLACEMENT

THE FOLLOWING QUANTITIES HAVE BEEN PROVIDED FOR THE REPLACEMENT OF DEFICIENT CURB RAMPS. THE REPLACEMENT OF CURB RAMPS SHALL BE AS DIRECTED BY THE ENGINEER.

THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 202 WALK REMOVED **360** SQ. FT.
ITEM 608 CURB RAMP **360** SQ. FT.

ITEM 617 - COMPACTED AGGREGATE, TYPE A

THIS ITEM SHALL BE USED ALONG THE SHOULDERS., AS SHOWN ON THE TYPICAL SECTIONS, AND AS DIRECTED BY THE ENGINEER.

THE ACTUAL DEPTH USED WILL VARY DEPENDING UPON EXISTING CONDITIONS. FOR ESTIMATING PURPOSES, AN AVERAGE DEPTH OF 2 IN. WILL BE USED. WATER, IF NEEDED, SHALL BE APPLIED AS PER 617 AND INCLUDED UNDER ITEM 617 - COMPACTED AGGREGATE, TYPE A.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY:

ITEM 617 COMPACTED AGGREGATE, TYPE A **27** CU. YD.

ITEM 632 - DETECTOR LOOP, AS PER PLAN

AN ESTIMATED QUANTITY OF ITEM 632 - DETECTOR LOOP, AS PER PLAN HAS BEEN PROVIDED AS A CONTINGENCY WHEN WIRE IS CUT, BROKEN, OR DESTROYED DUE TO PAVEMENT PLANING, PAVEMENT REPAIR OR BUTT JOINT OPERATIONS. IT IS IMPERATIVE THAT REPLACEMENT OF LOOP DETECTORS BE INSTALLED AND FULLY FUNCTIONAL IN THE SHORTEST POSSIBLE TIME. THE CONTRACTOR SHALL HAVE REPLACEMENT LOOP DETECTORS INSTALLED AND FULLY FUNCTIONAL WITHIN 7 CALENDAR DAYS OF DESTRUCTION OF THE ORIGINAL LOOP.

FAILURE TO COMPLY WITH THE ABOVE STATED REQUIREMENTS WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES ACCORDING TO SECTION 108.07 OF THE CMS FOR EACH CALENDAR DAY BEYOND THE SPECIFIED LIMIT.

THE NEW LOOP DETECTORS SHALL BE PLACED AFTER ANY PAVEMENT REPAIRS WITHIN THE LOOP DETECTORS ARE COMPLETED BUT PRIOR TO THE PLACEMENT OF THE ASPHALT SURFACE COURSE.

NEW LOOP DETECTORS SHALL BE PLACED AT THE SAME LOCATIONS AND BE THE SAME SIZE AND TYPE AS THE EXISTING. THE LOOP DETECTOR WIRE SHALL BE REPLACED TO THE PULL BOX OR POLE, WHICHEVER IS APPLICABLE, UNDER ITEM 632 AND TC-82.10. THE NEW CABLE SPLICE KITS SHALL BE INCLUDED IN THIS PAY ITEM.

THIS WORK ITEM SHALL INCLUDE THE POURED EPOXY INSULATED SPLICE(S) REQUIRED TO CONNECT THE LOOP DETECTOR WIRE TO EXISTING LEAD-IN CABLE AT THE PULLBOX. THE SPLICES SHALL BE IN ACCORDANCE WITH SECTION 713.15 OF THE CMS. PAYMENT SHALL BE MADE PER EACH LOOP DETECTOR CONNECTED TO THE LEAD-IN CABLE.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:

ITEM 632 DETECTOR LOOP, AS PER PLAN **3** EACH

FOR ESTIMATING PURPOSES ONLY: APPROXIMATELY **183** FT. OF SAW CUT AND **296** FT. OF DETECTOR WIRE.

ITEM 255 - FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS FS

THIS ITEM SHALL CONSIST OF REPLACING EXISTING PAVEMENT IN ACCORDANCE WITH ITEM 255 AND THE NOTES BELOW.

EXISTING CONCRETE PAVEMENT THICKNESS MAY VARY FROM THAT SHOWN ON THE TYPICAL SECTIONS. NO ADJUSTMENT IN PAYMENT FOR THIS ITEM SHALL BE MADE PROVIDING THAT THE AVERAGE PAVEMENT THICKNESS IS WITHIN ONE HALF INCH OF THE THICKNESS SHOWN ON THE TYPICAL SECTIONS. ADDITIONAL COMPENSATION SHALL BE MADE BY CHANGE ORDER FOR THE MATERIAL COST OF CONCRETE ONLY WHEN THE AVERAGE THICKNESS EXCEEDS THE ONE HALF INCH MAXIMUM TOLERANCE ABOVE. THE VOLUME OF ADDITIONAL CONCRETE PAID FOR SHALL BE BASED UPON THE AMOUNT OF CONCRETE ABOVE THE ONE HALF INCH TOLERANCE LIMIT.

IF, AFTER REMOVAL OF THE RIGID PAVEMENT THE ENGINEER DETERMINES THAT THE SUBBASE OR SUBGRADE HAS FAILED OR IS PUMPING. HE SHALL DIRECT THE CONTRACTOR TO EXCAVATE THE UNSUITABLE MATERIAL AND REPLACE IT WITH COMPACTED 304 AGGREGATE. QUANTITIES OF ITEM 203, EXCAVATION AND ITEM 304, AGGREGATE BASE HAVE BEEN PROVIDED TO REPAIR SAID FAILED SUBBASE OR SUBGRADE AREAS.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER:

ITEM 203 EXCAVATION NOT INCLUDING EMBANKMENT **60** CU. YD. CONSTRUCTION
ITEM 304 AGGREGATE BASE, AS PER PLAN **60** CU. YD.
ITEM 255 FULL DEPTH RIGID PAVEMENT REMOVAL AND RIGID **160** SQ. YD. REPLACEMENT, CLASS FS
ITEM 255 FULL DEPTH PAVEMENT SAWING **425** LIN. FT.

DUST CONTROL

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER FOR DUST CONTROL:

ITEM 616 WATER **10** M. GAL
ITEM 616 CALCIUM CHLORIDE **1** TON

ITEM SPECIAL - MISC.: NOVACHIP

ALL REFERENCES TO ULTRATHIN BONDED WEARING COURSE SHALL BE CONSIDERED TO READ NOVACHIP

DESCRIPTION:

THIS SPECIFICATION COVERS THE REQUIREMENTS FOR THE PLACEMENT OF AN ULTRATHIN BONDED WEARING COURSE AND SHALL CONSIST OF APPLICATION OF A WARM POLYMER MODIFIED EMULSION MEMBRANE FOLLOWED IMMEDIATELY WITH AN ULTRATHIN OVERLAY OF HOT ASPHALT CONCRETE. THE POLYMER MODIFIED EMULSION MEMBRANE SHALL BE SPRAY APPLIED IMMEDIATELY PRIOR TO THE APPLICATION OF THE HOT ASPHALT CONCRETE OVERLAY SO AS TO PRODUCE A HOMOGENEOUS WEARING SURFACE THAT CAN BE OPENED TO TRAFFIC IMMEDIATELY UPON SUFFICIENT COOLING. THE FINISHED WEARING COURSE SHALL HAVE A MINIMUM THICKNESS OF EIGHTY POUNDS PER SQUARE YARD FOR TYPE "B" MIX (3/8IN.) AGGREGATE.

MATERIALS:

THE CONTRACTOR SHALL FORMULATE AND SUBMIT A JOB MIX-FORMULA THAT SATISFIES THE DESIGN GENERAL LIMITS LISTED IN TABLE 1 - MIXTURE REQUIREMENTS. THE PRODUCTION TOLERANCES IN TABLE 1 WILL BE PERMITTED TO EXCEED THE DESIGN GENERAL LIMITS.

Table 1 - Mixture Requirements			
Composition by weight percentages			
SIEVES		3/8 in. - Type B	
ASTM	mm	Design General Limits, % Passing	Production Tolerance, %
3/4 inch*	19		
1/2 inch	12.7	100	
3/8 inch	9.5	85 - 100	±5
#4	4.75	28 - 38	±4
#8	2.36	25 - 32	±4
#16	1.18	15 - 23	±3
#30	0.60	10 - 18	±3
#50	0.30	8 - 13	±3
#100	0.15	6 - 10	±2
#200	0.075	4 - 7	±2
Asphalt Content, %		4.8 - 5.6	
Draindown Test		0.10% max	
Moisture Sensitivity, AASHTO T283**		80% min	
Asphalt Grade Conforming to PG for Climate and Traffic Conditions			

* A target of 100% passing the 5/8" is recommended. Mixtures containing 5/8" aggregate size will require greater paving thickness.
** Specimens for T-283 testing are to be compacted using the Superpave gyratory compactor. The mixtures are to be compacted using 100 gyrations. Mixture and compaction temperatures are to be as recommended by the binder supplier.

CALCULATED JFC CHECKED LGM
GENERAL NOTES
CUY-90-16.22/VAR.
10
54

COARSE AGGREGATE:

THE COARSE AGGREGATES SELECTED SHOULD BE THOSE TYPICALLY USED FOR HIGH PERFORMANCE SURFACES. COARSE AGGREGATE SHOULD MEET THE SKID RESISTANCE CRITERIA AS SET FORTH BY THE SPECIFYING AGENCY OR HAVE A HISTORY OF SUCCESSFUL USE IN SURFACE MIXES. COARSE AGGREGATES, MATERIAL RETAINED ABOVE THE #4 SIEVE, SHALL BE FROM APPROVED SOURCES AND SHALL MEET THE REQUIREMENTS LISTED IN TABLE 2.

COARSE AGGREGATES, SUCH AS CRUSHED GRAVEL, LIMESTONE, DOLOMITE, SANDSTONE, GRANITE, CHERT, TRAPROCK, ORE TAILINGS, SLAG, OR OTHER SIMILAR MATERIALS, OR BLENDS OF TWO OR MORE OF THE ABOVE MAY BE ACCEPTABLE. WHEN COARSE AGGREGATES FOR THESE MIXES ARE FROM MORE THAN ONE SOURCE OR OF MORE THAN ONE TYPE OF MATERIAL, THEY SHALL BE PROPORTIONED AND BLENDED TO PROVIDE A UNIFORM MIXTURE IF APPROVED BY THE ENGINEER.

Tests	Method	Limit
Los Angeles abrasion value ¹ , % loss	AASHTO T 96-94	35 max
Soundness ¹ , % loss	Magnesium Sulfate or Sodium Sulfate	18 max
		12 max
Flat & Elongated Ratio	ASTM D 4791	25% max (3:1)
% Crushed, single face	ASTM D 5821	100 min
% Crushed, Two or more Mechanically crushed faces	ASTM D 5821	85 min
Micro-Deval, % loss	ASTM D 5821	18 max

¹ Note: Values shown for these tests are targets for aggregate selection purposes. The results of these tests should not be the sole basis for rejection.

FINE AGGREGATE:

THE FINE AGGREGATES WILL BE PART OF THE ASPHALT MASTIC. THE FINE AGGREGATE, PASSING THE #4 SIEVE, SHALL MEET THE REQUIREMENTS OF TABLE 3.

Tests	Method	Limit
Sand Equivalent ²	AASHTO T 176-86	45 min
Methylene Blue ² (on materials passing 200)	AASHTO TP 57-99	10 max
Uncompacted Void Content	AASHTO T 304-96	40 min

² Note: Values shown for these tests are targets for aggregate selection purposes. The results of these tests should not be the sole basis for rejection. If the finished bituminous mixture passes the AASHTO T-283 requirement in Table 1, the sand equivalent and methylene blue requirements may be waived.

MINERAL FILLER:

MINERAL FILLER MAY BE USED AS AN OPTION TO AID IN MEETING THE GRADATION REQUIREMENTS. HYDRATED LIME, CERTAIN CLASSES OF FLY ASH, BAGHOUSE FINES AND TYPE 1 PORTLAND CEMENT ARE ACCEPTABLE AS MINERAL FILLER.

Typical acceptable gradation:
100% passing #600 mm
75-100% passing #75 mm

POLYMER MODIFIED EMULSION MEMBRANE:

THE EMULSION SHALL BE POLYMER MODIFIED EMULSION MEMBRANE.

CONSTRUCTION DETAILS:**A. EQUIPMENT**

THE CONTRACTOR SHALL USE A SELF-PRIMING PAVER, DESIGNED AND BUILT FOR THE PURPOSE OF APPLYING THE ULTRATHIN BONDED WEARING COURSE, AND APPEARING ON THE CURRENT AGENCY APPROVED LIST. REQUESTS FOR APPROVAL OF EQUIPMENT NOT CURRENTLY ON THE APPROVED LIST SHALL BE MADE TO THE DIRECTOR OF THE APPROPRIATE BUREAU, PRIOR TO THE START OF ANY WORK. ALL OTHER EQUIPMENT AND TOOLS SHALL BE APPROVED BY THE ENGINEER. ALL EQUIPMENT AND TOOLS SHALL BE MAINTAINED IN SATISFACTORY WORKING CONDITION AT ALL TIMES.

B. APPLICATION

THE ULTRATHIN BONDED WEARING COURSE SHALL NOT BE PLACED ON A WET PAVEMENT. THE PAVEMENT SURFACE TEMPERATURE SHALL BE NOT LESS THAN 10°C (50°F) AT THE TIME OF PLACEMENT. A DAMP PAVEMENT SURFACE IS ACCEPTABLE FOR PLACEMENT IF IT IS FREE OF STANDING WATER AND FAVORABLE WEATHER CONDITIONS ARE EXPECTED TO FOLLOW.

THE POLYMER MODIFIED EMULSION MEMBRANE SHALL BE SPRAYED BY A METERED MECHANICAL PRESSURE SPRAY BAR AT A TEMPERATURE OF 60-80°C (140 - 180°F). THE SPRAYER SHALL ACCURATELY AND CONTINUOUSLY MONITOR THE RATE OF SPRAY AND PROVIDE A UNIFORM APPLICATION ACROSS THE ENTIRE WIDTH TO BE OVERLAID. THE RATE OF SPRAY SHALL BE IN THE RANGE OF 0.85 L/M² ± 0.3 L/M² (0.2 GAL/YD² ± 0.07 GAL/YD²) AS DETERMINED BY THE MIX DESIGN. ADJUSTMENTS TO THE SPRAY RATE SHALL BE MADE BASED UPON THE EXISTING PAVEMENT SURFACE CONDITIONS AND RECOMMENDATIONS OF THE POLYMER MODIFIED EMULSION MEMBRANE SUPPLIER.

NO WHEEL OR OTHER PART OF THE PAVING MACHINE SHALL COME IN CONTACT WITH THE POLYMER MODIFIED EMULSION MEMBRANE BEFORE THE HOT MIX ASPHALT CONCRETE WEARING COURSE IS APPLIED.

THE HOT MIX ASPHALT CONCRETE SHALL BE APPLIED AT A TEMPERATURE OF 150 - 165°C (302 - 330°F) AND SHALL BE SPREAD OVER THE POLYMER MODIFIED EMULSION MEMBRANE IMMEDIATELY AFTER THE APPLICATION OF THE NOVABOND. THE HOT ASPHALT CONCRETE WEARING COURSE SHALL BE PLACED OVER THE FULL WIDTH OF THE POLYMER MODIFIED EMULSION MEMBRANE WITH A HEATED, COMBINATION VIBRATORY-TAMPING BAR SCREED.

BECAUSE OF THE MINIMAL DEPTH OF THE HOT MIX ASPHALT CONCRETE BEING PLACED, IT MAY BE DAMAGED IF OPENED TO TRAFFIC TOO QUICKLY. THEREFORE, THE NEW PAVEMENT SHALL NOT BE OPENED TO TRAFFIC UNTIL THE ROLLING OPERATION IS COMPLETE AND THE MATERIAL HAS COOLED SUFFICIENTLY TO RESIST DAMAGE. THE COOLING TIME WILL BE BRIEF DUE TO THE MINIMAL DEPTH OF THE MAT.

C. SURFACE PREPARATION

THE FOLLOWING ITEMS WILL BE PERFORMED PRIOR TO THE COMMENCEMENT OF PAVING OPERATIONS AND PAID FOR UNDER THE APPROPRIATE ITEM NUMBERS.

1. MANHOLE COVERS, DRAINS, GRATES CATCH BASINS AND OTHER SUCH UTILITY STRUCTURES SHALL BE PROTECTED AND COVERED WITH PLASTIC OR BUILDING FELT PRIOR TO PAVING AND ALSO SHALL BE CLEARLY REFERENCED FOR LOCATION AND ADJUSTMENT AFTER PAVING.
2. THERMOPLASTIC TRAFFIC MARKINGS SHALL BE REMOVED IF GREATER THAN 5-MM (0.2") THICKNESS (RIDE QUALITY).
3. PAVEMENT CRACKS AND JOINTS GREATER THAN 6.3 MM (0.25") WIDE SHALL BE CLEANED AND FILLED USING AN APPROVED MATERIAL AND METHOD. THE MAXIMUM FILM THICKNESS ALLOWED WILL BE 5 MM (0.2") FOR RIDE QUALITY.
4. SURFACE IRREGULARITIES GREATER THAN 25 MM (1") DEEP SHALL BE FILLED WITH A MATERIAL APPROVED BY THE ENGINEER.
5. THE ENTIRE PAVEMENT SURFACE TO BE OVERLAID SHALL BE THOROUGHLY CLEANED, GIVING SPECIFIC ATTENTION TO ACCUMULATED MUD AND DEBRIS. PRESSURIZED WATER AND/OR VACUUM SYSTEMS MAY BE REQUIRED TO INSURE A CLEAN SURFACE.

D. PAVING EQUIPMENT

THE SELF-PRIMING MACHINE SHALL BE CAPABLE OF SPRAYING THE POLYMER MODIFIED EMULSION MEMBRANE, APPLYING THE HOT ASPHALT CONCRETE OVERLAY AND LEVELING THE SURFACE OF THE MAT IN ONE PASS AT THE RATE OF 10-30 M/MINUTE (30.5 TO 92 FT/MINUTE). THE SELF-PRIMING PAVING MACHINE SHALL INCORPORATE A RECEIVING HOPPER, FEED CONVEYOR, INSULATED STORAGE TANK FOR POLYMER MODIFIED EMULSION MEMBRANE, POLYMER MODIFIED EMULSION MEMBRANE SPRAY BAR AND A VARIABLE WIDTH, HEATED, TAMPER BAR SCREED. THE SCREED SHALL HAVE THE ABILITY TO BE CROWNED AT THE CENTER BOTH POSITIVELY AND NEGATIVELY AND HAVE VERTICALLY ADJUSTABLE EXTENSIONS TO ACCOMMODATE THE DESIRED PAVEMENT PROFILE.

E. COMPACTION

COMPACTION OF THE WEARING COURSE SHALL CONSIST OF A MINIMUM OF TWO PASSES WITH A STEEL DOUBLE DRUM ASPHALT ROLLER OF MINIMUM WEIGHT OF 10 METRIC TONS, BEFORE THE MATERIAL TEMPERATURE HAS FALLEN BELOW 85°C (185°F). AT NO TIME SHALL THE ROLLER OR ROLLERS BE ALLOWED TO REMAIN STATIONARY ON THE FRESHLY PLACED ASPHALT CONCRETE. COMPACTION SHALL IMMEDIATELY FOLLOW THE PLACEMENT OF THE ULTRATHIN BONDED WEARING COURSE WITH AN APPROVED ASPHALT ROLLER(S). ROLLER(S) SHALL BE WELL MAINTAINED, IN RELIABLE OPERATING CONDITION AND BE EQUIPPED WITH FUNCTIONING WATER SYSTEM AND SCRAPERS TO PREVENT ADHESION OF THE FRESH MIX ONTO THE ROLLER DRUMS. ADEQUATE ROLLER UNITS SHALL BE SUPPLIED SO THE COMPACTION WILL BE ACCOMPLISHED PROMPTLY FOLLOWING THE PLACEMENT OF THE MATERIAL. A RELEASE AGENT (ADDED TO THE WATER SYSTEM) MAY BE REQUIRED TO PREVENT ADHESION OF THE FRESH MIX TO THE ROLLER DRUM AND WHEELS. COMPACTION SHALL NORMALLY BE DONE IN THE STATIC MODE.

F. QUALITY CONTROL

THE FOLLOWING MEASURES SHALL BE USED BY THE CONTRACTOR TO MAINTAIN QUALITY CONTROL AND UNIFORMITY. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING ALL THE QUALITY CONTROL (QC) SAMPLES. THE SAMPLING RATE SHALL BE SPACED EQUIDISTANT BASED ON THE EXPECTED DAILY PRODUCTION. PRIOR TO PRODUCTION, THE (ENGINEER/CONSTRUCTION MANAGER) WILL APPROVE THE SAMPLING METHOD USED BY THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE EQUIPMENT OPERATION AND CALIBRATION.

1. POLYMER MODIFIED EMULSION MEMBRANE- THE POLYMER MODIFIED EMULSION MEMBRANE APPLICATION RATE AS DETERMINED BY THREE YIELD CHECKS DAILY SHALL NOT EXCEED A TOLERANCE OF ± 0.09 L/M² (± 0.02 GAL/YD²) FROM THE ESTABLISHED JMF APPLICATION RATE AS DETERMINED BY THE MIX DESIGN AND/OR THE RECOMMENDATIONS BY THE MATERIAL SUPPLIER.
2. BITUMINOUS WEARING COURSE-THE BITUMINOUS WEARING COURSE APPLICATION RATE AS DETERMINED BY A MINIMUM OF THREE YIELD CHECKS DAILY, SHALL NOT EXCEED A TOLERANCE OF 1.9 KG/M² (±3.5 LB/YD²) OF THE TARGET APPLICATION RATE.
3. THE RESULTS OF THE DAILY POLYMER MODIFIED EMULSION MEMBRANE YIELD CHECKS AND DAILY BITUMINOUS WEARING COURSE YIELD CHECKS WILL BE DOCUMENTED AND SUBMITTED TO THE (ENGINEER/CONSTRUCTION MANAGER) DAILY.

SAMPLING OF THE BITUMINOUS WEARING COURSE WILL TAKE PLACE AT THE AREA JUST BEFORE THE SCREED OF THE PAVER UNIT.

ONE DAILY SAMPLE OF THE BITUMINOUS SURFACE COURSE PLACED SHALL BE TESTED BEFORE THE NEXT DAY'S PRODUCTION. IF THIS TEST RESULT VARIES FROM THE JMF BY MORE THAN THE QUALITY CONTROL TOLERANCES OF TABLE 5, PRODUCTION WILL STOP. THE CONTRACTOR SHALL IDENTIFY THE CAUSE AND DOCUMENT, IN DETAIL WHAT CORRECTIVE ACTION WAS TAKEN. THE JMF MAY ONLY BE ADJUSTED IF THE REVISED JMF MEETS THE MIXTURE REQUIREMENTS SET FORTH IN THE PROJECT SPECIFICATIONS.

% Passing Indicated Sieves Size	Type A Mix Tolerance, %	Type B Mix Tolerance, %	Type C Mix Tolerance, %
3/4			
1/2			
3/8		±5	
#4		±4	
#8		±4	
#200		±2.0	
Asphalt Binder Content, %		±0.5	

G. QUALITY ASSURANCE SAMPLING AND TESTING

THE ENGINEER/CONSTRUCTION MANAGER IS RESPONSIBLE FOR ALL QUALITY ASSURANCE (QA) SAMPLING AND TESTING, EXCEPT WHERE STATED BELOW. QUALITY ASSURANCE TESTING ON BITUMINOUS WEARING COURSE WILL BE DONE AT THE FIELD/REGIONAL LABORATORY. QUALITY ASSURANCE TESTING SHALL BE COMPLETED IN A REASONABLE TIME. SAMPLING AND TESTING METHODS WILL BE THE SAME AS USED BY THE CONTRACTOR.

1. BITUMINOUS WEARING COURSE BINDER - THE CONTRACTOR SHALL TAKE A DAILY SAMPLE OF THE BINDER AND SUBMIT TO THE ENGINEER/CONSTRUCTION MANAGER FOR INFORMATION ONLY.

2. POLYMER MODIFIED EMULSION MEMBRANE- THE CONTRACTOR SHALL TAKE A DAILY SAMPLE OF THE POLYMER MODIFIED ASPHALT EMULSION AND SUBMIT TO THE ENGINEER/CONSTRUCTION MANAGER FOR INFORMATION ONLY.
3. BITUMINOUS WEARING COURSE - THE TOTAL QUANTITY OF THE BITUMINOUS WEARING COURSE SHALL BE DIVIDED INTO THREE EQUAL SUBLOTS FOR ACCEPTANCE PURPOSES. A RANDOM SAMPLE SHALL BE TAKEN PER SUBLLOT FOR OWNER TESTING. IF ALL THREE SUBLLOT TEST RESULTS ARE IN AGREEMENT WITH TABLE 5 TOLERANCES, AS COMPARED TO THE JMF, THE LOT WILL BE ACCEPTED.
4. PAY ADJUSTMENTS - IF ANY SUBLLOT TEST RESULT ON AGGREGATE GRADATION ON ANY ONE SIEVE, OR ASPHALT BINDER CONTENT IS OUTSIDE RANGE 1 BUT WITHIN RANGE 2 TOLERANCE LIMITS OF TABLE 6, A PAY ADJUSTMENT OF MAY BE APPLIED TO THAT SUBLLOT QUANTITY OF ULTRATHIN BONDED WEARING COURSE.

IF ANY SUBLLOT TEST RESULT ON AGGREGATE GRADATION ON ANY ONE SIEVE OR ASPHALT BINDER CONTENT IS OUTSIDE RANGE 2 TOLERANCE LIMITS ON TABLE 6, A NEGATIVE PAY ADJUSTMENT WILL BE APPLIED TO THAT SUBLLOT QUANTITY OF ULTRATHIN BONDED WEARING COURSE.

IF IN THE ENGINEER'S JUDGEMENT, DEFECTIVE AREAS WARRANT REMOVAL, THE CONTRACTOR SHALL REMOVE AND REPLACE THOSE AREAS AT THE CONTRACTOR'S EXPENSE WITH MATERIALS MEETING SPECIFICATION REQUIREMENTS.

Bituminous Wearing Course	Range	Designated Sieves					Asphalt Binder Content
		1/2"	3/8"	#4	#8	#200	
	Range 1	±5.0	±5.0	±5.0	±4.0	±1.0	±0.4
	Range 2	±8.0	±8.0	±8.0	±6.0	±2.0	±0.5

H. WARRANTY ITEMS AND REMEDIAL ACTION:

WARRANTY ITEMS AND REMEDIAL ACTIONS ARE SPECIFIED IN TABLE A. THE WARRANTY APPLIES ONLY TO THE MAINLINE PAVEMENT LANES AND RAMPS AND SHALL BE IN EFFECT FOR A PERIOD OF THREE (3) YEARS FROM CONSTRUCTION COMPLETION. THE WARRANTY DOES NOT APPLY TO STRUCTURAL PROBLEMS BELOW THE PAVEMENT PLACED AS PART OF THIS PROJECT, PROVIDED THE STRUCTURAL PROBLEM IS NOT THE FAULT OF THE CONTRACTOR. THE THRESHOLD LEVELS ARE BASED ON THE 0.1 MILE SEGMENTS DESCRIBED BELOW.

MEETING THE MINIMUM REQUIREMENTS AND GUIDELINES OF THIS NOTE ARE NOT TO BE CONSTRUED AS A WARRANTY, EXPRESSED OR IMPLIED, AS TO THE MATERIALS PROPERTIES AND WORKMANSHIP EFFORTS REQUIRED TO MEET THE PERFORMANCE CRITERIA SET FORTH IN TABLE A. PER THE CONSTRUCTION AND MATERIAL SPECIFICATIONS, HEAVY TRAFFIC IS EXPECTED. THE INTENT OF THIS CONTRACT IS FOR THE CONTRACTOR TO PROVIDE A MAINTENANCE FREE PAVEMENT. THE CONTRACTOR MAY PERFORM ROUTINE MAINTENANCE DURING THE WARRANTY PERIOD, BUT THIS ROUTINE MAINTENANCE IS LIMITED TO ROUTING AND SEALING THE PAVEMENT WITH TYPE 1 CRACK SEAL IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 925 OR OTHER REPAIRS AUTHORIZED BY THE DEPARTMENT. THE CONTRACTOR'S CONSTRUCTION TRAFFIC CONTROL FOR PERFORMING ANY WORK REQUIRED OR ALLOWED BY THIS NOTE DURING THE WARRANTY PERIOD SHALL BE IN ACCORDANCE WITH CURRENT DEPARTMENT POLICY, THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, AND SUBJECT TO DEPARTMENT APPROVAL OF THE TIME THE WORK WILL BE PERFORMED. ANY MAJOR CHANGE IN DEPARTMENT CONSTRUCTION TRAFFIC CONTROL POLICY WILL BE CONSIDERED A CHANGED CONDITION. ASPHALT CONCRETE USED FOR REMEDIAL ACTION WORK OR REPLACEMENT OF SAMPLED AREAS (SEE TABLE A NOTE 3) SHALL BE APPROVED BY THE ENGINEER. THE ENGINEER WILL TAKE INTO ACCOUNT THE DEPARTMENT'S DESIGN CRITERIA FOR THE PAVEMENT TYPE. THE DEPTH OF A REPAIR AREA MAY BE INCREASED BY THE ENGINEER TO ALLOW FOR THE SIZE OF AGGREGATE IN THE ASPHALT CONCRETE. FOR REMEDIAL ACTION WORK, THE ENGINEER MAY APPROVE ALTERNATIVES TO THE EXTENT OR TYPE OF SPECIFIED REMEDIAL ACTION.

ANY PAVEMENT MARKINGS OR RAISED PAVEMENT MARKERS (RPM) REMOVED OR OBLITERATED WHILE PERFORMING A REMEDIAL ACTION SHALL BE REPLACED WITH PAVEMENT MARKINGS OR RPMs EQUAL TO OR BETTER THAN THE ORIGINAL PRODUCTS AT THE CONTRACTOR'S COST. ALL REMEDIAL ACTIONS SHALL BE PERFORMED ON OR BEFORE SEPTEMBER 30. PRIOR TO PERFORMING A REMEDIAL ACTION, THE CONTRACTOR SHALL SUBMIT A REMEDIAL ACTION PLAN TO THE ENGINEER FOR APPROVAL. THIS PLAN SHALL STATE WHEN AND HOW THE REMEDIAL ACTION WILL BE DONE, WHAT MATERIAL WILL BE USED, AND HOW TRAFFIC WILL

BE CONTROLLED WHILE THE CONTRACTOR IS PERFORMING THE REMEDIAL ACTION. EMERGENCY WORK, REPAIRING PAVEMENT DISTRESSES WHICH ARE HAZARDOUS TO THE TRAVELING PUBLIC, WILL BE PERFORMED BY THE DEPARTMENT. IF THE EMERGENCY WORK IS EXTENSIVE, THE DEPARTMENT MAY AUTHORIZE THE CONTRACTOR TO DO THE REPAIRS. THE DISTRICT CONSTRUCTION ENGINEER (DCE) WILL DETERMINE IF THE DISTRESS IS OR IS NOT THE FAULT OF THE CONTRACTOR. IF THE DCE DETERMINES THE DISTRESS IS THE FAULT OF THE CONTRACTOR, THE COST OF THIS EMERGENCY WORK, NO MATTER WHO DOES THE EMERGENCY WORK, INCLUDING CONSTRUCTION TRAFFIC CONTROL, WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS NOT RESPONSIBLE FOR PAVEMENT DAMAGE BEYOND THE CONTRACTOR'S CONTROL (I.E., CAR FIRE, OIL SPILL, ETC.).

ANNUAL REVIEW:

THE PROJECT SHALL BE DIVIDED INTO 1 MILE SECTIONS. THE WIDTH OF EACH SECTION WILL BE THE WIDTH OF A SINGLE LANE. EACH SECTION SHALL BE DIVIDED INTO 0.1 MILE SEGMENTS. EACH YEAR, BETWEEN MARCH 1 AND APRIL 30, THE PROJECT WILL BE REVIEWED BY A DISTRICT REVIEW TEAM (DRT). THE DRT (THE AREA ENGINEER, THE COUNTY MANAGER, A REPRESENTATIVE FROM THE PLANNING DEPARTMENT AND A REPRESENTATIVE FROM THE PRODUCTION DEPARTMENT) SHALL NOTIFY THE CONTRACTOR OF THE SCHEDULED REVIEW. THE CONTRACTOR OR ANY OTHER INTERESTED PARTY MAY ATTEND THE ANNUAL REVIEW, FOR OBSERVATION ONLY. ANY COMMENTS BY THE CONTRACTOR OR OTHER INTERESTED PARTY WILL BE RECORDED BY THE DRT. THE DRT WILL PICK AT LEAST TWO SEGMENTS IN EACH SECTION TO REVIEW, BUT MAY REVIEW THE ENTIRE SECTION. WITHIN 15 DAYS AFTER THE COMPLETION OF THE REVIEW, THE RESULTS WILL BE ISSUED IN WRITING TO THE CONTRACTOR. BASED ON THE RESULTS OF A PRELIMINARY REVIEW BY A MEMBER OF THE DRT, THE DISTRICT DEPUTY DIRECTOR MAY AUTHORIZE AN ADDITIONAL REVIEW WITHIN 1 YEAR AFTER THE FORM C-85 IS ISSUED OR WAIVE THE YEARLY REVIEW FOR ALL OR PART OF THE PROJECT. AN ADDITIONAL REVIEW WOULD BE CONTACTED IN THE SAME WAY AS A YEARLY REVIEW. ANY WAIVER WILL BE IN WRITING TO THE CONTRACTOR.

APPEAL PROCESS:

THE CONTRACTOR MAY APPEAL A FINDING OF THE DRT. ANY APPEAL SHALL BE SUBMITTED TO THE DCE, IN WRITING, WITHIN 15 DAYS AFTER THE WRITTEN RESULTS OF THE DRT ARE GIVEN TO THE CONTRACTOR. IF THE RESULTS INCLUDE RUTTING BEYOND THE THRESHOLD LEVEL, THE SUBMISSION TIME LIMIT IS CHANGED TO 15 DAYS AFTER REMOVING THE SLABS (SEE TABLE A NOTE 3) FOR A DISPUTE OVER RUTTING ONLY. THE DCE WILL EVALUATE THE CONTRACTOR'S APPEAL. THIS EVALUATION WILL INCLUDE REVIEWING THE DISPUTED AREA IN THE FIELD AND CONSULTING WITH THE CONSTRUCTION SECTION OF THE OFFICE OF HIGHWAY MANAGEMENT. THE EVALUATION MAY ALSO INCLUDE REVIEWING TEST DATA, OBTAINING SAMPLES, OR INTERVIEWING DEPARTMENT (DISTRICT OR CENTRAL OFFICE) OR CONTRACTOR EMPLOYEES. THE DCE'S DETERMINATION WILL BE ISSUED IN WRITING TO THE CONTRACTOR WITHIN 45 DAYS AFTER THE DCE RECEIVES THE APPEAL. IF THE CONTRACTOR DISAGREES WITH THE DCE'S DETERMINATION, THE CONTRACTOR MAY APPEAL THE DETERMINATION USING AN ARBITRATION METHOD ACCEPTABLE TO THE DEPARTMENT. THE DEPARTMENT WILL AGREE, IN ALL CASES, TO ARBITRATION IN THE MANNER IN WHICH THOSE METHODS ARE PRACTICED BY THE DEPARTMENT. IF THE CONTRACTOR SELECTS ARBITRATION, WRITTEN NOTICE OF THIS APPROACH MUST BE MADE TO THE DCE WITHIN 15 DAYS OF RECEIPT OF THE DCE'S DETERMINATION. AFTER WRITTEN NOTICE HAS BEEN PROVIDED, THE PARTIES SHALL AGREE IN WRITING TO THE ARBITRATOR AND AGREE TO SHARE EQUALLY THE FEES OF THE ARBITRATOR. AFTER THE ARBITRATOR IS GIVEN NOTICE TO PROCEED, THE ARBITRATOR SHALL CONDUCT AN INVESTIGATION AND ISSUE A DETERMINATION WITHIN 45 DAYS. THE ARBITRATOR'S DETERMINATION WILL BE LIMITED TO DETERMINING WHETHER OR NOT THE PAVEMENT DISTRESS IS OR IS NOT THE FAULT OF THE CONTRACTOR.

DISTRESS TYPE	THRESHOLD LEVEL (PER SEGMENT)	REMEDIAL ACTION
DISINTEGRATED AREA (1)	NONE	(4)
PREVIOUS PATCHING (2)	300 SQUARE FEET	(5)
RUTTING (3)	0.250 INCH	(4)

(1) THIS INCLUDES ALL TYPES OF DISINTEGRATION, INCLUDING, BUT NOT LIMITED TO, MIX DELAMINATION, POTHOLE, AND RAVELING. THIS INCLUDES ANY TYPE OF DISINTEGRATION THAT OCCURS AT A JOINT OR CRACK.

(2) AN AREA OF MULTIPLE PATCHES IS CALCULATED AS THE WIDTH OF THE LANE TIMES THE LENGTH OF THE PATCHED AREA. THESE PATCHES CONSIST OF REMEDIAL ACTIONS MADE BY THE CONTRACTOR OR PATCHES MADE BY THE DEPARTMENT IN DISTRESSED AREAS THAT HAVE BEEN DETERMINED TO BE THE CONTRACTOR'S FAULT.

(3) THIS THRESHOLD LIMIT ONLY APPLIES FOR 1 YEAR AFTER CONSTRUCTION COMPLETION OR AFTER ANY REMEDIAL ACTION WORK.

THIS THRESHOLD LIMIT DOES NOT APPLY TO THE LAST 250 FEET OF PAVEMENT BEFORE A FORCED STOP CONTROL (I.E., STOP SIGN, TRAFFIC SIGNAL, ETC.).

MEASURE THE WHEEL PATH WITH A 4 FOOT STRAIGHT EDGE AT 6 LOCATIONS IN A SEGMENT. IF ONE MEASUREMENT EXCEEDS THE THRESHOLD LEVEL, THE ENTIRE SEGMENT WILL BE MEASURED AT 50 FOOT INTERVALS FOR EACH WHEEL PATH. REMEDIAL ACTION IS REQUIRED IF SIX OR MORE MEASUREMENTS EXCEED THE THRESHOLD LEVEL.

TO DETERMINE THE DEPTH OF THE DISTRESSED AREA, THE CONTRACTOR SHALL CUT A 1 FOOT BY 4 FOOT SLAB TO A DEPTH NECESSARY TO DETERMINE THE DEPTH OF THE DISTRESS AT A MAXIMUM OF THREE LOCATIONS DETERMINED BY THE DRT. THE SLABS SHALL BE RETAINED FOR POSSIBLE USE IN ANY APPEAL PROCESS. COST OF THIS SLAB REMOVAL AND REPLACEMENT, INCLUDING CONSTRUCTION TRAFFIC CONTROL, IS PAID BY THE CONTRACTOR, UNLESS IT IS DETERMINED THE RUTTING IS NOT THE CONTRACTOR'S FAULT. SLABS SHALL BE REMOVED WITHIN 30 DAYS AFTER RECEIVING THE RESULTS OF THE REVIEW.

(4) REMOVE AND REPLACE THE DISTRESSED AREA TO THE DEPTH NEEDED TO REPAIR THE DISTRESSED AREA.

(5) REMOVE AND REPLACE THE SURFACE IN THIS SEGMENT'S LANE TO A MINIMUM DEPTH OF 1.5 INCHES, FROM THE END OF THE FIRST DOWN STATION SEGMENT WITH NO PATCHES TO THE BEGINNING OF THE FIRST UP STATION SEGMENT WITH NO PATCHES.

METHOD OF MEASUREMENT:

THE ULTRATHIN BONDED WEARING COURSE SHALL BE MEASURED BY THE NUMBER OF TONS OF PAVEMENT PLACED IN ACCORDANCE WITH THIS SPECIFICATION.

BASIS OF PAYMENT:

THE UNIT PRICE BID PER TON SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE WORK.

PAYMENT WILL BE MADE UNDER:

Item No.	Item	Pay Unit
SPECIAL	MISC.: NOVACHIP	PER TON

ITEM 304 - AGGREGATE BASE, AS PER PLAN

THE ONLY SLAG MATERIALS PERMITTED FOR THIS ITEM SHALL BE CRUSHED AIR-COOLED BLAST FURNACE SLAG, A MIXTURE OF CRUSHED AND GRANULATED SLAGS, OR OPEN HEARTH SLAG FROM APPROVED SOURCES ON FILE AT THE LABORATORY.

ALL MATERIALS OR BLENDED MATERIALS SHALL MEET THE GRADATION REQUIREMENTS OF 304.02.

ANY GRANULATED SLAG MATERIAL USED SHALL MEET THESE GRADATION REQUIREMENTS IN LIEU OF 703.08

MAINTAINING VEHICULAR TRAFFIC

GENERAL PROVISIONS

1. TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE "SCHEDULE OF THRU LANES TO BE MAINTAINED" DESCRIBED ON SHEET NO. 16. THE CONTRACTOR SHALL SET UP AND OPERATE HIS EQUIPMENT IN SUCH A MANNER AS TO MINIMIZE ENCROACHMENT UPON THE TRAVELED WIDTH OF PAVEMENT.
2. THE CONTRACTOR SHALL NOTIFY THE ENGINEER, THE RESPONSIBLE LAW ENFORCEMENT AGENCY AND THE OHIO DEPARTMENT OF TRANSPORTATION, DISTRICT 12 PUBLIC INFORMATION OFFICER ((216) 581-2333, EXT. 244) NOT LESS THAN TWENTY-FOUR (24) HOURS PRIOR TO A SCHEDULED DISRUPTION OF TRAFFIC.
3. NIGHTTIME (10:00 PM TO 6:00 AM) WORK SHALL BE PERMITTED IN ACCORDANCE WITH THESE PLANS AND NOTES. THE CONTRACTOR SHALL PROVIDE FLOOD LIGHTING OF THE WORK AREA IN ORDER TO ASSURE THE SAFEST CONDITIONS DURING NIGHTTIME WORK. A LIGHTING PLAN FOR NIGHTTIME OPERATIONS SHALL BE PRESENTED TO AND APPROVED BY THE ENGINEER.
4. THE CONTRACTOR SHALL FURNISH, ERECT AND MAINTAIN ALL NEW WARNING AND INFORMATION SIGNS NECESSARY FOR MAINTAINING TRAFFIC. THE CONTRACTOR SHALL DETERMINE WHAT SIGNS ARE NEEDED AND ADVISE THE ENGINEER TWO (2) WEEKS IN ADVANCE OF HIS DETAILED PLANS.

SEE THE ODOT AND STANDARD DRAWINGS FOR THE MINIMUM SIGNAGE REQUIRED.
5. TRAFFIC CONTROL DEVICES SHALL BE SET UP PRIOR TO THE START OF CONSTRUCTION, AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SPECIAL CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS THEY ARE NEEDED AND SHALL BE IMMEDIATELY REMOVED THEREAFTER. WHERE OPERATIONS ARE PERFORMED IN STAGES, THERE SHALL BE IN PLACE ONLY THOSE DEVICES THAT APPLY TO THE CONDITION PRESENT DURING STAGE IN PROGRESS. ALL SIGNS WITH MESSAGES WHICH DO NOT APPLY DURING A CERTAIN PERIOD SHALL BE COVERED OR SET ASIDE OUT OF THE VIEW OF TRAFFIC.
6. PLACEMENT OF FINAL ROADWAY PAVEMENT MARKINGS AND RAISED PAVEMENT MARKERS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE "SCHEDULE OF THRU LANES TO BE MAINTAINED" DESCRIBED ON SHEET NO. 16.

THE CONTRACTOR SHALL PROVIDE TWO (2) TRAILING VEHICLES AS PER MT-99.20M FOLLOWING THE PAVEMENT MARKING EQUIPMENT. THE TWO (2) TRAILING VEHICLES SHALL TRAVEL 500 FEET APART WITH THE REMOTE VEHICLE TRAVELING ON THE SHOULDER (LEFT OR RIGHT AS APPLICABLE) WHERE USABLE SHOULDER IS AVAILABLE. THE FIRST TRAIL VEHICLE IN A TRAFFIC LANE SHALL BE EQUIPPED WITH A TRUCK MOUNTED ATTENUATOR MEETING NCHRP 350 REQUIREMENTS. THE INTERMEDIATE TRAILING VEHICLE SHALL TRAVEL IN THE CLOSED LANE 500 FEET BEHIND THE PAVEMENT MARKING EQUIPMENT. THE POLICE CRUISER SHALL TRAVEL 500 TO 1000 FEET BEHIND THE REMOTE TRAILING VEHICLE. EACH TRAILING VEHICLE SHALL HAVE A YELLOW FLASHING BEACON PLUS 48" MIN. ORANGE AND BLACK CONSTRUCTION WARNING SIGNS MOUNTED ON THE BACK FACING TRAFFIC WITH STANDARD TYPE MESSAGES ADVISING MOTORISTS OF THE WORK AHEAD, ADVISORY WARNING SPEED AND WHICH LANE IS CLOSED.
7. NO STOPPAGE OF TRAFFIC SHALL OCCUR WITHOUT LAW ENFORCEMENT PERSONNEL AT EACH LOCATION TO DIRECT TRAFFIC.

MAINTAINING VEHICULAR TRAFFIC (CONT.)

8. WHENEVER A TOTAL CLOSURE IS IMPLEMENTED, THE CONTRACTOR SHALL PROVIDE A PORTABLE CHANGEABLE MESSAGE SIGN, TYPE FROM ODOT'S PRE-APPROVED LIST. IT SHALL BE PLACED 1.5 MILES TO 2 MILES IN ADVANCE OF THE CLOSURE OR AS DIRECTED BY THE ENGINEER.
9. FOR ANY OPERATION NOT SPECIFICALLY MENTIONED IN THESE PLANS, THE TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".
10. ALL LABOR, MATERIALS, EQUIPMENT AND ANY INCIDENTALS REQUIRED TO COMPLETE THE WORK AS DESCRIBED ABOVE SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614, MAINTAINING TRAFFIC.

TRAFFIC CONTROL MATERIALS

A. SIGNS

SIGN DIMENSIONS AND SPECIFICATIONS, INCLUDING LETTER SIZES, SHALL BE AS PROVIDED IN THE "MANUAL", OR IN SIGN DESIGN DRAWINGS PROVIDED BY THE DEPARTMENT OF TRANSPORTATION. THE SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER PRIOR TO THE START OF THE PROJECT.

ALL SIGNS SHALL HAVE A REFLECTORIZED BACKGROUND OF REFLECTIVE MATERIALS AS DESCRIBED IN THE "MANUAL".

B. SIGN SUPPORTS

TEMPORARY SIGN SUPPORTS SHALL BE AS SHOWN ON MT-105.10M AND MT-105.11M.

C. DRUMS

DRUMS SHALL BE IN ACCORDANCE WITH PERTINENT SECTIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL PERMANENT LANE CLOSURES SHALL BE DELINEATED WITH DRUMS SPACED AT 50 FEET CENTER TO CENTER. ALL COSTS FOR INSTALLING, MAINTAINING AND SUBSEQUENT REMOVAL OF SAID DRUMS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 614, MAINTAINING TRAFFIC.

D. LIGHTING DEVICES

FLASHERS SHALL BE 12 VOLT BATTERY OPERATED MODELS WITH 7 INCH DIAMETER YELLOW LENSES ILLUMINATED BY RAPID INTERMITTENT FLASHES OF SHORT DURATION AND SHALL BE PLACED ON ALL SIGNS AT ALL TIMES.

CONTINUOUS BURN LIGHTS SHALL BE 12 VOLT BATTERY OPERATED MODELS WITH MINIMUM 7 INCH DIAMETER YELLOW LENSES.

E. FLASHING ARROW BARRICADE

WHENEVER ANY PART OF THE TRAVELED SURFACE IS CLOSED, THE MOTORIST SHALL BE WARNED AND DIVERTED BY THE CONTRACTOR THROUGH THE USE OF ONE FLASHING ARROW BARRICADE FOR EACH LANE CLOSED. THE CONTRACTOR SHALL REFER TO STANDARD DRAWING MT-35.10M & MT-35.11M AND THE PROVISION SET FORTH IN OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS FOR ALL INFORMATION REGARDING FURNISHING, MAINTAINING, AND USE OF FLASHING ARROW BARRICADES. IF THE FLASHING ARROW BARRICADE IS WITHIN 300 FT OF A RESIDENCE OR ON A SURFACE STREET, A SOLAR POWERED FLASHING ARROW BARRICADE SHALL BE USED. PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614, MAINTAINING TRAFFIC.

MAJOR WORK ITEMS

- A. BITUMINOUS PAVEMENT PLANING
- B. ASPHALT CONCRETE OVERLAY
- C. NOVACHIP
- D. INSTALL EPOXY PAVEMENT MARKINGS

CONTRACTOR'S EQUIPMENT - OPERATION AND STORAGE

VEHICLES AND EQUIPMENT SHALL ALWAYS MOVE WITH, AND NOT ACROSS OR AGAINST THE FLOW OF TRAFFIC. VEHICLES AND OTHER EQUIPMENT SHALL NOT PARK OR STOP EXCEPT WITHIN DESIGNATED WORK AREAS; AND SHALL NOT ENTER AND LEAVE WORK AREAS IN A MANNER WHICH WILL BE HAZARDOUS TO, OR INTERFERE WITH THE NORMAL TRAFFIC FLOW. PERSONAL VEHICLES WILL NOT BE PERMITTED TO PARK WITHIN THE RIGHT-OF-WAY EXCEPT IN SPECIFIC AREAS DESIGNATED BY THE ENGINEER.

EQUIPMENT, VEHICLES AND MATERIALS SHALL NOT BE STORED OR PARKED WITHIN 30 FEET OF THE TRAVELED WAY UNLESS 6 FEET BEHIND PCB OR GUARDRAIL.

ALL WORK VEHICLES AND EQUIPMENT THAT ENTERS THE WORK ZONE MORE THAN ONCE A DAY MUST BE EQUIPPED WITH AT LEAST ONE FLASHING, ROTATING, OR OSCILLATING AMBER LIGHT THAT IS VISIBLE IN ALL DIRECTIONS OF TRAFFIC FOR AT LEAST ONE QUARTER OF A MILE, DAY OR NIGHT.

ITEM 614 - PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, AND REMOVE WHEN NO LONGER NEEDED A PORTABLE CHANGEABLE MESSAGE SIGN (S). THE PCMS SHALL BE OF THE TYPE SHOWN ON THE LIST OF APPROVED PCMS MAINTAINED BY THE DIRECTOR. THE PCMS SHALL BE A CLASS I OR II TYPE UNIT. NO FLIP DISK ALLOWED.

THE PORTABLE CHANGEABLE MESSAGE SIGN SHALL BE MOUNTED ON A TRAILER. THE LOCATION OF THE PCMS SHALL BE AS DIRECTED BY THE ENGINEER. THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS.

THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE LINK WHICH WILL ALLOW REMOTE SIGN ACTIVATION, DEACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES.

THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER THE SOFTWARE NECESSARY TO CONTROL THE PCMS REMOTELY.

THE PCMS SHALL BE EQUIPPED WITH A MYRIAD SAFETY BEAM OR AN APPROVED EQUAL AS DETERMINED BY THE ENGINEER. THE MYRIAD SAFETY BEAM SENDS OUT A SIGNAL THAT ACTIVATES RADAR DETECTORS. THE BEAM IS APPROVED BY THE F.C.C. THE MYRIAD SAFETY BEAM SHALL USE THE SAME POWER SUPPLY AS THE PCMS. THE MYRIAD SAFETY BEAM SHALL BE ABLE TO BE ACTIVATED WITH THE PCMS RUNNING OR NOT. THE MYRIAD SAFETY BEAM IS DISTRIBUTED BY THE TRIPLEX GROUP, INC., P.O. BOX 428. NEW HOPE, PA. 18938. PHONE (215) 862-5077.

AT THE DIRECTION OF THE ENGINEER THE PCMS MAY BE REMOVED FOR PERIODS OR TIMES WHEN NOT IN USE. NO PAYMENT WILL BE MADE FOR THESE TIMES (EX. WINTER MONTHS).

THERE SHALL BE TWO CLASS I OR II CHANGEABLE MESSAGE SIGN AT 6 MONTHS EACH.

ITEM 614 - PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 12 SIGN-MONTHS

I:\PROJECTS\1d20655\dgn\20655mmd.dgn 26-OCT-2000 12:59PM jgr:mvse

CALCULATE	JRC	CHECKED	LGM
MAINTENANCE OF TRAFFIC GENERAL NOTES			
CUYAHOGA COUNTY CUY-90-16.22/VAR.			
13			
54			

SUSPENSION OF WORK

IF THE CONTRACTOR FAILS TO COMPLY WITH THE PROVISIONS FOR TRAFFIC CONTROL AS SET FORTH IN THESE PLANS OR WITH PROVISIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, THE ENGINEER SHALL SUSPEND WORK UNTIL THE CONTRACTOR COMPLIES WITH THE NECESSARY REQUIREMENTS.

SIGNAGE

ADVANCE WARNING SIGN GROUPS AS PER STANDARD DRAWINGS MT-95.30M, MT-98.12M, MT-98.13M, MT-98.14M, MT-98.15M, MT-98.16M, MT-98.17M, AND MT-98.18M SHALL BE INSTALLED, PAYMENT FOR THESE SIGNS SHALL BE UNDER ITEM 614 - MAINTAINING TRAFFIC.

MAINTENANCE OF TRAFFIC CONTROL ZONES

THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN THE SIGNS, DRUMS AND TEMPORARY PAVEMENT MARKINGS AT THE LOCATIONS DETAILED IN THE PLANS OR SPECIFIED IN THE STANDARD DRAWINGS. WHEN THE CONTRACTOR IS NOTIFIED OF DEFICIENCIES HE SHALL CORRECT THE DEFICIENCIES AS SOON AS POSSIBLE, PREFERABLY WITHIN 12 HOURS AND NO LATER THAN 24 HOURS. IF ANY NOTED DEFICIENCIES ARE NOT CORRECTED WITHIN 24 HOURS THE ENGINEER SHALL DEDUCT ONE DAY PAY FOR ITEM 614 - MAINTAINING TRAFFIC, NOT AS A PENALTY BUT AS LIQUIDATED DAMAGES. THE CONTRACTOR SHALL BE SUBJECT TO THESE LIQUIDATED DAMAGES FOR EACH AND EVERY DAY THAT THESE PROVISIONS ARE NOT MET. ALL COSTS FOR MAINTAINING THE WORK ZONES AS DESCRIBED ABOVE SHALL BE INCLUDED UNDER ITEM 614 - MAINTAINING TRAFFIC.

PERMANENT PAVEMENT MARKINGS

AFTER PLACING THE SURFACE COURSE, THE CONTRACTOR MAY PLACE PERMANENT PAVEMENT MARKINGS AT LOCATIONS SHOWN IN THE TYPICALS AND THE TRAFFIC CONTROL SHEETS INSTEAD OF PLACING TEMPORARY PAVEMENT MARKINGS, WHICH SHALL BE NON-PERFORMED AT THESE LOCATIONS.

NIGHT VEST

ALL OF THE CONTRACTORS AND SUB-CONTRACTORS PERSONNEL WORKING DURING THE HOURS OF DARKNESS SHALL WEAR A 100% SILVER REFLECTIVE SAFETY VEST. THE SAFETY VEST SHALL BE PROVIDED BY THE CONTRACTOR. THE VEST MAY HAVE SEVERAL LIME OR ORANGE STRIPES ON IT.

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR

IN ADDITION TO THE REQUIREMENTS OF ITEM 614 AND THE LATEST EDITION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD), A UNIFORMED LAW ENFORCEMENT OFFICER AND OFFICIAL PATROL CAR WITH WORKING TOP MOUNTED EMERGENCY FLASHING LIGHTS SHALL BE PROVIDED FOR CONTROLLING TRAFFIC FOR THE FOLLOWING TASKS:

- FOR TOTAL CLOSURES OF EXIT RAMPS.
- WHEN DIRECTED BY THE ENGINEER.

LAW ENFORCEMENT OFFICERS (L.E.O.'S) SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED. THE LEO'S ARE CONSIDERED TO BE EMPLOYED BY THE CONTRACTOR AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR ACTIONS. ALTHOUGH THEY ARE EMPLOYED BY THE CONTRACTOR, THE PROJECT ENGINEER SHALL HAVE CONTROL OVER THEIR PLACEMENT. THE OFFICIAL PATROL CAR SHALL BE A PUBLIC SAFETY VEHICLE AS REQUIRED BY THE OHIO REVISED CODE.

LAW ENFORCEMENT OFFICERS WITH PATROL CAR REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614 - LAW ENFORCEMENT OFFICER W/PATROL CAR . .150 HOURS

THE HOURS PAID SHALL INCLUDE MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

IF THE CONTRACTOR WISHES TO UTILIZE LEO'S FOR FLAGGING AND TRAFFIC CONTROL OTHER THAN FOR THAT REQUIRED IN THESE PLANS, HE MAY DO SO AT HIS OWN EXPENSE.

RAMP CLOSURES FOR REPAIRS OR RESURFACING

THE CONTRACTOR MAY CLOSE ONE RAMP AT A TIME FOR PAVEMENT PLANING, REPAIRS, OR RESURFACING. THE CLOSURES SHALL BE LIMITED TO THE HOURS SHOWN IN THE "SCHEDULE OF THRU LANES TO BE MAINTAINED" TABLE. THE MOTORING PUBLIC SHALL BE GIVEN ADVANCE WARNING OF CLOSURES AT LEAST 72 HOURS IN ADVANCE THROUGH THE USE OF EITHER A GROUND MOUNTED FLAT SHEET SIGN OR A PORTABLE CHANGEABLE MESSAGE SIGN. A LEO WITH PATROL CAR (PAID FOR SEPARATELY) SHALL BE USED FOR EACH RAMP CLOSURE AND BE PRESENT FOR THE ENTIRE CLOSURE TIME.

FREEWAY ENTRANCE RAMPS SHALL BE CLOSED WITH A PCMS SUGGESTING A RECOMMENDED DETOUR.

FREEWAY EXIT RAMPS SHALL BE CLOSED WITH A PCMS ROUTING TRAFFIC TO THE NEXT EXIT AND A SECOND PCMS INDICATING A U-TURN THAT EXIT (UNLESS DIRECTED DIFFERENTLY BY THE ENGINEER).

FOR CLOSURES ONE OR TWO PCMS UNITS MAY BE NEEDED. THESE UNITS SHALL BE PAID FOR UNDER ITEM 614 - MAINTAINING TRAFFIC.

HOLIDAY CLOSURES

NO WORK SHALL BE PERFORMED AND ALL EXISTING LANES SHALL BE OPEN TO TRAFFIC DURING THE FOLLOWING DESIGNATED HOLIDAYS OR EVENTS:

- CHRISTMAS
- NEW YEARS
- EASTER
- MEMORIAL DAY
- FOURTH OF JULY
- LABOR DAY
- THANKSGIVING

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THIS PERIOD:

DAY OF THE WEEK	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00N FRIDAY THROUGH 12:00N MONDAY
MONDAY	12:00N FRIDAY THROUGH 12:00N TUESDAY
TUESDAY	12:00N MONDAY THROUGH 12:00N WEDNESDAY
WEDNESDAY	12:00N TUESDAY THROUGH 12:00N THURSDAY
THURSDAY	12:00N WEDNESDAY THROUGH 12:00N MONDAY
FRIDAY	12:00N THURSDAY THROUGH 12:00N MONDAY
SATURDAY	12:00N FRIDAY THROUGH 12:00N MONDAY

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED LIQUIDATED DAMAGES IN ACCORDANCE WITH 108.07.

SPECIAL EVENT LIMITATIONS

DURING THE NIGHT OF ALL CLEVELAND INDIAN GAMES, DURING ANY STADIUM, GUND ARENA OR DOWNTOWN EVENT WITH ATTENDANCE IN EXCESS OF 20,000, NO ADDITIONAL LANE CLOSURES SHALL BE IMPLEMENTED UNTIL ONE (1) HOUR AFTER THE EVENT. ANTICIPATED EVENTS INCLUDE GAMES OF THE INDIANS, BROWNS, CAVALIERS, CONCERTS, FIREWORKS, ETC.

FLOODLIGHTING

FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHT TIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE THE ADEQUACY OF THE FLOODLIGHT PLACEMENT, THE CONTRACTOR AND THE ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR MAINTAINING TRAFFIC.

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MAINTENANCE OF TRAFFIC GENERAL NOTES

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

PLANED SURFACES

THE DURATION OF TIME BETWEEN PLANING THE EXISTING ASPHALT PAVEMENT AND PLACING THE ASPHALT CONCRETE INTERMEDIATE COURSE SHALL BE KEPT TO A MINIMUM. IN NO INSTANCE SHALL THIS TIME EXCEED 7 CALENDAR DAYS. THIS IS TO ENSURE THAT THE POTENTIAL DEGRADATION OF THE EXISTING PAVEMENT DUE TO TRAFFIC IS KEPT TO A MINIMUM. IN THE EVENT THAT THE TIME BETWEEN PLANING THE PAVEMENT AND PLACING THE ASPHALT INTERMEDIATE COURSE EXCEEDS 7 CALENDAR DAYS, LIQUIDATED DAMAGES AS PER 108.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS MANUAL SHALL BE ASSESSED.

TRAFFIC CONTROL AND SEQUENCE OF ASPHALT CONCRETE WORK

ALL ASPHALT CONCRETE OPERATIONS SHALL BE CONDUCTED IN A MANNER THAT WILL ASSURE MINIMUM DANGER AND INCONVENIENCE TO THE HIGHWAY USERS. ALL ASPHALT WORK SHALL BE PERFORMED AT THE TIMES PROVIDED IN THE "SCHEDULE OF THRU LANES TO BE MAINTAINED" NOTE ON SHEET 16. THE PROCEDURE FOR INSTALLATION OF ANY ASPHALT LAYER SHALL BE SUCH THAT NO GREATER THAN 1-1/2 INCH DISCONTINUITY IN THE ELEVATION OF THE TRAVELED SURFACE SHALL BE EXPOSED TO TRAFFIC.

THE CONTRACTOR SHALL SCHEDULE HIS OPERATIONS SUCH THAT ALL HALF-WIDTH OVERLAYS ARE NOT EXPOSED TO TRAFFIC FOR MORE THAN 24 HOURS.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS ANY PART-WIDTH RESURFACING JOINT EXCEPT AS IS NECESSARY DURING THE ACTUAL RESURFACING OPERATION. ANY PART WIDTH RESURFACING JOINTS WHICH MUST BE EXPOSED TO TRAFFIC SHALL BE RAMPED USING ITEM 614 - BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC AT A RATE NOT TO EXCEED 2 INCHES IN 1 FOOT (LONGITUDINAL JOINTS).

TEMPORARY TRANSVERSE RESURFACING JOINTS WHICH MUST BE EXPOSED TO TRAFFIC SHALL BE RAMPED USING ITEM 614 - BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC AT A RATE NOT TO EXCEED 1 INCH IN 10 FEET.

WHENEVER TRAFFIC IS SUBJECTED TO HALF-WIDTH OVERLAYS PRIOR TO COMPLETING THE ASPHALT COURSE, THE CONTRACTOR SHALL PROVIDE OW-171-48 AND OW-P-171-24 SIGNS (DUAL SIGN INSTALLATION). PLACEMENT SHALL BE AS DIRECTED BY THE ENGINEER AND INCLUDED IN THE LUMP SUM BID FOR ITEM 614, MAINTAINING TRAFFIC.

TRAFFIC MUST BE MAINTAINED AT ALL TIMES IN BOTH DIRECTIONS IN ACCORDANCE WITH THE "SCHEDULE OF THRU LANES TO BE MAINTAINED".

WHENEVER ANY PART OF THE TRAVELED SURFACE IS CLOSED, THE MOTORISTS SHALL BE WARNED AND DIVERTED BY THE CONTRACTOR THROUGH THE USE OF A FLASHING ARROW, IN ADDITION TO THOSE PROVISIONS SET FORTH IN THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

ITEM 614 - BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC

THIS ITEM SHALL BE USED TO PROVIDED TEMPORARY ASPHALT RAMPS FOR TRANSVERSE DISCONTINUITIES. RAMPING SHALL BE PLACED AT THE RATE OF 1" PER 10 FT.

TEMPORARY ASPHALT RAMPS SHALL BE REMOVED AS PART OF THIS ITEM.

ITEM 614 - BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC 500 CU. YD.

ITEM 614 - BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC, AS PER PLAN

THIS ITEM SHALL BE USED TO REPAIR HOLES IN BRIDGE DECKS, ROADWAY SURFACE AND BERMS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO MONITOR THE ROADWAY TO DETERMINE WHEN THE HOLES SHALL BE PATCHED. THE CONTRACTOR MUST NOTIFY THE ENGINEER FOR HIS/HER APPROVAL.

THE CONTRACTOR WILL BE RESPONSIBLE FOR DAMAGES TO MOTORIST VEHICLES IF THE HOLES ARE NOT FILLED IN A REASONABLE AMOUNT OF TIME.

THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE ROADWAY, BRIDGE DECKS AND BERMS (IN THE DIRECTION WORK IS BEING PERFORMED) FROM THE FIRST DAY OF WORK UNTIL CONSTRUCTION IS COMPLETE. THIS INCLUDES PERIODS WHEN WORK IS SUSPENDED.

THE PROCEDURE FOR PATCHING A HOLE IS:

REMOVE ALL LOOSE AND DISINTEGRATED ASPHALT OR CONCRETE TO AN EXTENT TO EXPOSE SOUND CONCRETE OR ASPHALT. THE PERIMETER OF ALL REMOVAL AREAS SHALL BE VERTICAL.

CARE SHALL BE TAKEN ON BRIDGE DECKS NOT TO PUNCTURE THE DECK OR DAMAGE THE REINFORCING STEEL. THE CONTRACTOR SHALL TAKE WHAT EVER STEPS NECESSARY TO MAKE THE BRIDGE DECK PASSABLE.

THE SURFACE TO BE PATCHED MUST BE CLEANED AND DRIED.

THE ENTIRE SURFACE SHALL BE TACK COATED, INCLUDING THE VERTICAL FACES.

ASPHALT CONCRETE SHALL BE IN ACCORDANCE TO ITEM 404 OR 402 AS DETERMINED BY THE ENGINEER. IT SHALL BE PLACED IN 2 INCH LIFTS AND COMPACTED TO THE LEVEL OF THE WEARING SURFACE.

DURING WINTER MONTHS ONLY WHEN ASPHALT IS NOT AVAILABLE OR AT THE DIRECTION OF THE ENGINEER COLD MIX MAY BE USED. COMPACTION EQUIPMENT MUST BE APPROVED BY THE ENGINEER.

ALL TRAFFIC CONTROL NEEDED FOR THIS ITEM OF WORK SHALL BE INCLUDED IN THIS ITEM OF WORK.

ITEM 614 - BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC, AS PER PLAN 200 CU. YD.

CONSTRUCTION TRAFFIC

ALL CONSTRUCTION TRAFFIC SHALL USE ACCEPTABLE TRUCK ROUTES TO ACCESS THE CONSTRUCTION AREA. USE OF LOCAL RESIDENTIAL STREETS IS STRICTLY PROHIBITED UNLESS ALLOWED IN WRITING BY THE LOCAL ENFORCEMENT AUTHORITY.

ITEM 630 - SIGNING MISC.: ADDITIONAL SIGNS, GROUND MOUNTED, AS DIRECTED BY THE ENGINEER

WHEN ADDITIONAL SIGNING IS NEEDED TO MAINTAIN TRAFFIC, THE CONTRACTOR SHALL FURNISH THE SIGN OR SIGNS AS DIRECTED BY THE ENGINEER. THESE SIGNS SHALL BE GROUND MOUNTED AND MEET ALL THE SPECIFICATIONS OF THE PLAN, PROPOSAL AND CURRENT YEAR CMS.

PAYMENT FOR THIS ITEM SHALL INCLUDE BUT NOT BE LIMITED TO THE COST TO FURNISH AND ERECT THE SIGN, INCLUDING DRIVE POSTS OR OTHER APPROVED METHODS OF SUPPORT, MAINTAINING THE SIGN AND REMOVAL OF THE SIGN.

THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 630 - SIGNING MISC.: ADDITIONAL SIGNS, GROUND MOUNTED, AS DIRECTED BY THE ENGINEER...200 SQ. FT.

TEMPORARY PAVEMENT MARKINGS

TEMPORARY MARKINGS SHALL BE PLACED AT THE LOCATIONS OF THE PERMANENT MARKINGS AS SHOWN IN THE TRAFFIC CONTROL PLANS.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY, TO BE USED AS DIRECTED BY THE ENGINEER, TO PLACE TEMPORARY PAVEMENT MARKINGS AFTER THE CONTRACTOR HAS PLANED THE EXISTING ASPHALT AND AFTER THE PROPOSED OVERLAY HAS BEEN PLACED.

- ITEM 614 - TEMPORARY LANE LINE, CLASS I, 642 PAINT 0.26 MILE
- ITEM 614 - TEMPORARY LANE LINE, CLASS II, 642 PAINT 9.02 MILE
- ITEM 614 - TEMPORARY CENTER LINE, CLASS I, 642 PAINT 0.15 MILE
- ITEM 614 - TEMPORARY EDGE LINE, CLASS I, 642 PAINT. 14.70 MILE
- ITEM 614 - TEMPORARY CHANNELIZING LINE, CLASS I, 642 PAINT 10,940 L. F.
- ITEM 614 - TEMPORARY DOTTED LINE, CLASS I, 642 PAINT 2037 L. F.
- ITEM 614 - TEMPORARY TRANSVERSE LINE, CLASS I, 642 PAINT 4931 L. F.
- ITEM 614 - TEMPORARY STOP LINE, CLASS I, 642 PAINT. 630 L. F.

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MAINTENANCE OF TRAFFIC GENERAL NOTES

CUYAHOGA COUNTY
CUY-90-16.22/AR.

GENERAL

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE THRU VEHICULAR ACCESS IN BOTH DIRECTIONS AT ALL TIMES THROUGHOUT THE PROJECT AREA. THE PROJECT SHALL BE CONSTRUCTED IN PHASES IN ORDER TO MINIMIZE TRAFFIC DISRUPTION AND INCONVENIENCE TO THE GENERAL PUBLIC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL EQUIPMENT, MATERIALS AND MANPOWER NEEDED TO ADEQUATELY MAINTAIN TRAFFIC AS PROVIDED FOR IN THE PLANS AND SPECIFICATIONS.

THE CONTRACTOR IS REMINDED THAT, IN THE CONDUCT OF THIS PROJECT, HIS SEQUENCE OF OPERATIONS SHALL BE PLANNED IN SUCH A WAY AS TO MINIMIZE THE NUMBER OF LANE REDUCTIONS AND/OR LANE WIDTH REDUCTIONS REQUIRED TO MAINTAIN TRAFFIC THROUGH THE PROJECT.

PERMITTED LANE CLOSURES SHALL BE AS SHOWN ON THE "SCHEDULE OF THRU LANES TO BE MAINTAINED TABLE." THE TIME LIMITS SHOWN IN THIS TABLE SHALL BE ADHERED TO OR LIQUIDATED DAMAGES WILL BE ASSESSED.

AUGUST 31ST SHALL BE CONSIDERED TO CONSTITUTE AN INTERIM COMPLETION DATE AND LIQUIDATED DAMAGES SHALL BE ASSESSED IN ACCORDANCE WITH 108.07 FOR EACH CALENDAR DAY UNTIL THE PROJECT IS COMPLETED.

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET THIS REQUIREMENT THE CONTRACTOR SHALL BE ASSESSED LIQUIDATED DAMAGES IN ACCORDANCE WITH 108.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.

DATE FOR COMPLETION

ALL CONSTRUCTION WORK ON THE PROJECT SHALL BE COMPLETED ON OR BEFORE THE SEVENTY-FIFTH (75) DAY FOLLOWING THE START OF WORK DATE GIVEN BY THE CONTRACTOR TO THE STATE AT THE PRECONSTRUCTION MEETING, AND NO LATER THAN THE COMPLETION DATE INDICATED IN THE PROPOSAL.

THE AWARDED CONTRACTOR HAS A WINDOW OF TIME IN WHICH TO CONSTRUCT THIS PROJECT. FAILURE TO COMPLETE ALL CONSTRUCTION ACTIVITIES, ONCE INITIATED, SHALL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN ACCORDANCE WITH SECTION 108.07 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.

LIQUIDATED DAMAGES/SHORT TERM LANE CLOSURES

SHORT TERM LANE CLOSURES ARE THOSE WHICH ARE PERMITTED BY THE "SCHEDULE OF THRU LANES TO BE MAINTAINED" TABLE.

THESE TIMES SHALL NOT BE REVISED WITHOUT PRIOR APPROVAL FROM THE DISTRICT 12 WORK ZONE TRAFFIC CONTROL ENGINEER.

SHORT TERM LIQUIDATED DAMAGES SHALL ALSO BE ASSESSED WHEN A RAMP CLOSURE IS VIOLATED.

IF SHORT TERM LANE CLOSURES ARE IN PLACE OUTSIDE THE SPECIFIED TIMES, LIQUIDATED DAMAGES IN THE AMOUNT OF \$ 90.00 PER MINUTE SHALL BE ASSESSED THE CONTRACTOR FOR EACH MINUTE THE LANE REMAINS CLOSED.

SHORT TERM LANE CLOSURES SHALL ONLY BE IMPLEMENTED WHEN WORK IS BEING CONTINUOUSLY PERFORMED. THE CLOSURE SHALL BE REMOVED AS SOON AS POSSIBLE AFTER WORK HAS STOPPED.

SCHEDULE OF THRU LANES TO BE MAINTAINED

N.A. - NOT APPLICABLE

⊕ - SEE "RAMP CLOSURE FOR RESURFACING" NOTE

ROAD	LANE REDUCTIONS			PERMITTED RAMP CLOSURES		
	1 LANE CLOSURE	2 LANE CLOSURE	3 LANE CLOSURE	YES/NO	SHORT TERM CLOSURE ⊕	
					WEEKDAYS	WEEKENDS
I-90 FROM I-71 TO I-77 (4 LANES, EB)	*	*	WEEKDAY 12:01 AM-5:00 AM			
	*	*	WEEKEND 12:01 AM-5:00 AM			
I-90 FROM I-71 TO I-77 (4 LANES, WB)	*	*	WEEKDAY 12:01 AM-5:00 AM			
	*	*	WEEKEND 12:01 AM-5:00 AM			
I-90 FROM I-77 TO INNERBELT CURVE (3 LANES, EB & WB)	*	*	NA			
	*	*	NA			
ALL RAMPS	NA	NA	NA	YES	7PM TO 6AM **	7PM TO 6AM **

* - ALL LANE CLOSURES LISTED ABOVE MAY ONLY BE IMPLEMENTED AT THE TIMES PERMITTED BY THE "DISTRICT 12, PERMITTED LANE CLOSURE TIMES" LIST, WHICH IS LOCATED ON THE ODOT WEB SITE:

www.dot.state.oh.us/dist12/workzone/laneclo.htm

THE LATEST REVISION, AT 14 DAYS PRIOR TO THE BID DATE, SHALL BE IN EFFECT FOR THIS PROJECT. NO LANE OR SHOULDER CLOSURES SHALL BE IN PLACE WHEN NO WORK IS BEING PERFORMED.

** - SEE "SPECIAL EVENT LIMITATIONS" NOTE

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MAINTENANCE OF TRAFFIC GENERAL NOTES

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

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Material Furnished by the Department Installation Only

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MATERIALS SUPPLIED BY THE DEPARTMENT

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

Description	One-Way White		One-Way Yellow		Two-Way White		Two-Way Yellow		Two-Way White-Red		Two-Way Yellow-Red	
	Cols.	Dist.	Cols.	Dist.	Cols.	Dist.	Cols.	Dist.	Cols.	Dist.	Cols.	Dist.
Raised Pavement Marker , Installation Only	615								232		330	
Total By Color	615								232		330	

	Total	Number of Conventional High Profile	Number of Tapered Low Profile	District Stored	Columbus Stored
Raised Pavement Marker, Installation Only	<u>1177</u>	_____	<u>1177</u>	_____	<u>1177</u>
Raised Pavement Marker Casting, Installation Only	_____	_____	_____	_____	_____
Prismatic Retro-Reflectors	_____	_____	_____	_____	_____
Raised Pavement Marker Misc.: Replacement of Raised Pavement Marker	_____	_____	_____	_____	_____

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PAVEMENT QUANTITIES

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ITEM SPECIAL - MISC.: NOVACHIP		NOVACHIP MINIMUM THICKNESS - 80LBS./SQ. YD.											SCL-SPEED CHANGE LANE				
LOCATION	FROM	TO	LENGTH (FT)	INSIDE SHOULDER (FT)	# OF LANES	MAINLINE LANES (FT)	SCL/OUTSIDE SHOULDER (AVERAGE WIDTH) (FT)	TOTAL WIDTH (FT)	INSIDE SHOULDER AREA (SQ YD)	MAINLINE AREA (SQ YD)	OUTSIDE SHOULDER/SCL AREA (SQ YD)	SPEC	SPEC	SPEC			
												INSIDE SHOULDER ASPHALT (TON)	MAINLINE ASPHALT (TON)	OUTSIDE SHOULDER/SCL ASPHALT (TON)			
I-90 EAST BOUND																	
	54+90.78	55+97.03	106.25	0	4	48	13	61	0	566.7	153.5	0.00	22.67	6.14	BROADWAY RAMP (E-4)		
	55+97.03	57+30.00	132.97	0	4	48	34.5	82.5	0	709.2	509.7	0.00	28.37	20.39			
	57+30.00	57+79.00	49.00	0	4	48	10	58	0	261.3	54.4	0.00	10.45	2.18			
	57+79.00	58+82.50	103.50	0	4	48	10	58	0	552.0	115.0	0.00	22.08	4.60			
	58+82.50	61+13.75	EAST 9TH ST BRIDGE														
	61+13.75	62+20.00	106.25	0	4	48	19	67	0	566.7	224.3	0.00	22.67	8.97			
	62+20.00	62+48.58	28.58	0	4	48	28	76	0	152.4	88.9	0.00	6.10	3.56	EAST 9 TH ST RAMP (E-6)		
	62+48.58	63+48.00	99.50	0	3	36	10	46	0	398.0	110.6	0.00	15.92	4.42			
	63+48.00	64+06.43	58.43	0	3	36	10	46	0	233.7	64.9	0.00	9.35	2.60			
	64+06.43	65+12.68	106.25	0	3	36	9	45	0	425.0	106.3	0.00	17.00	4.25			
	65+12.68	68+16.12	VARIOUS RAMPS UNDER I-90														
	68+16.12	69+22.37	106.25	0	3	36	10	46	0	425.0	118.1	0.00	17.00	4.72			
	69+22.37	69+75.25	52.88	0	3	36	10	46	0	211.5	58.8	0.00	8.46	2.35			
	69+75.25	70+81.50	106.25	0	3	36	10	46	0	425.0	118.1	0.00	17.00	4.72			
	70+81.50	73+94.00	EAST 14TH ST BRIDGE														
	73+94.00	75+00.25	106.25	3.5	4	48	10	61.5	41.3	566.7	118.1	1.65	22.67	4.72			
	75+00.25	76+85.50	185.25	3.5	4	48	10	61.5	72.0	988.0	205.8	2.88	39.52	8.23			
	76+85.50	77+25.00	39.50	3.5	4	48	12.15	63.65	15.4	210.7	53.3	0.62	8.43	2.13			
	77+25.00	78+86.88	161.88	3.5	3	36	35.15	74.65	63.0	647.5	632.2	2.52	25.90	25.29	EAST 22 ST RAMP (E-11)		
	78+86.88	80+09.31	122.43	3.5	3	36	10	49.5	47.6	489.7	136.0	1.90	19.59	5.44			
	80+09.31	83+09.31	300.00	5	3	36	10	51	166.7	1200.0	333.3	6.67	48.00	13.33			
	83+09.31	98+00.00	STATION EQUATION: 83+09.31 BK - 98+00.00 AH														
	98+00.00	98+53.75	53.75	6.5	3	36	10	52.5	38.8	215.0	59.7	1.55	8.60	2.39			
	98+53.75	99+10.00	56.25	6.5	3	36	10	52.5	40.6	225.0	62.5	1.62	9.00	2.50			
	99+10.00	100+26.00	116.00	6.5	3	36	10	52.5	83.8	464.0	128.9	3.35	18.56	5.16			
	100+26.00	100+82.75	56.75	6.5	3	36	10	52.5	41.0	227.0	63.1	1.64	9.08	2.52			
	100+82.75	102+00.00	117.25	6.5	3	36	10	52.5	84.7	469.0	130.3	3.39	18.76	5.21			
	102+00.00	104+45.00	245.00	6.5	3	36	33.5	76	176.9	980.0	911.9	7.08	39.20	36.48			
	104+45.00	105+30.00	85.00	6.5	3	36	44.5	87	61.4	340.0	420.3	2.46	13.60	16.81	CARNEGIE AVE. (RAMP NO. 3)		
	105+30.00	106+53.75	123.75	6.5	3	36	10	52.5	89.4	495.0	137.5	3.58	19.80	5.50			
	106+53.75	107+10.00	56.25	6.5	3	36	10	52.5	40.6	225.0	62.5	1.62	9.00	2.50			
	107+10.00	109+02.00	192.00	6.5	3	36	10	52.5	138.7	768.0	213.3	5.55	30.72	8.53			
	109+02.00	109+58.25	56.25	6.5	3	36	10	52.5	40.6	225.0	62.5	1.62	9.00	2.50			
	109+58.25	112+33.00	274.75	6.5	3	36	10	52.5	198.4	1099.0	305.3	7.94	43.96	12.21			
	112+33.00	113+25.00	92.00	6.5	3	36	34.75	77.25	66.4	368.0	355.2	2.66	14.72	14.21			
	113+25.00	113+90.00	65.00	6.5	4	48	18.5	73	46.9	346.7	133.6	1.88	13.87	5.34	PROSPECT AVE. (RAMP NO. 4)		
	113+90.00	120+10.00	620.00	6.5	4	48	10	64.5	447.8	3306.7	688.9	17.91	132.27	27.56			
	120+10.00	122+10.00	200.00	6.5	3	36	39.75	82.25	144.4	800.0	883.3	5.78	32.00	35.33			
	122+10.00	125+40.00	330.00	6.5	3	36	10	52.5	238.3	1320.0	366.7	9.53	52.80	14.67	CHESTER AVE. (RAMP NO. 7)		
	125+40.00	126+75.00	135.00	5.75	3	36	31.75	73.5	86.3	540.0	476.3	3.45	21.60	19.05			
	126+75.00	127+09.87	34.87	5.75	4	48	10.75	64.5	22.3	186.0	41.7	0.89	7.44	1.67	CHESTER AVE. (RAMP NO. 8)		
TOTAL THIS SHEET									2493.3	21628.5	8704.8	99.74	865.16	348.18			

ESTIMATED PAVEMENT QUANTITIES

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

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PAVEMENT QUANTITIES

ITEM SPECIAL - MISC.: NOVACHIP		NOVACHIP MINIMUM THICKNESS - 80LBS./SQ. YD.											SCL=SPEED CHANGE LANE				
LOCATION		LENGTH (FT)	INSIDE SHOULDER (FT)	# OF LANES	MAINLINE LANES (FT)	SCL/OUTSIDE SHOULDER (AVERAGE WIDTH) (FT)	TOTAL WIDTH (FT)	INSIDE SHOULDER AREA (SQ YD)	MAINLINE AREA (SQ YD)	SCL/OUTSIDE SHOULDER AREA (SQ YD)	SPEC	SPEC	SPEC				
											INSIDE SHOULDER ASPHALT (TON)	MAINLINE ASPHALT (TON)	OUTSIDE SHOULDER/SCL ASPHALT (TON)				
FROM	TO																
1-90 EAST BOUND																	
127+09.87	126+61.13	STATION EQUATION: 127+09.873 BK - 126+61.130 AH															
126+61.13	127+40.00	78.87	5.75	4	48	10.75	64.5	50.4	420.6	94.2	2.02	16.82	3.77				
127+40.00	130+00.00	260.00	6.5	3	36	18.75	61.25	187.8	1040.0	541.7	7.51	41.60	21.67				
130+00.00	132+21.00	221.00	6.5	3	36	12.75	55.25	159.6	884.0	313.1	6.38	35.36	12.52				
132+21.00	132+75.00	54.00	6.5	3	36	10	52.5	39.0	216.0	60.0	1.56	8.64	2.40				
132+75.00	133+65.00	90.00	6.5	3	36	10	52.5	65.0	360.0	100.0	2.60	14.40	4.00				
133+65.00	136+00.00	235.00	6.5	3	36	28.5	71	169.7	940.0	744.2	6.79	37.60	29.77	CHESTER AVE. (RAMP NO. 9)			
136+00.00	139+94.14	394.14	6.5	4	48	10	64.5	284.7	2102.1	437.9	11.39	84.08	17.52				
139+94.14	142+65.00	270.86	6.5	3	36	38	80.5	195.6	1083.4	1143.6	7.82	43.34	45.74	E 30TH ST. (RAMP NO. 12)			
142+65.00	151+00.00	835.00	6.5	3	38	10	54.5	603.1	3525.6	927.8	24.12	141.02	37.11	(14' LANE)			
151+00.00	154+60.00	360.00	4.5	3	40	10	54.5	180.0	1600.0	400.0	7.20	64.00	16.00	(14' LANE)			
154+60.00	156+48.00	188.00	4.5	4	52	12	68.5	94.0	1086.2	250.7	3.76	43.45	10.03	E 30TH ST. (RAMP NO. 15)			
156+48.00	159+75.00	327.00	4.5	4	52	8	64.5	163.5	1889.3	290.7	6.54	75.57	11.63				
159+75.00	160+95.00	120.00	4.5	4	52	17.5	74	60.0	693.3	233.3	2.40	27.73	9.33	ST. CLAIR (RAMP NO. 16)			
160+95.00	161+75.00	80.00	0	4	52	8	60	0.0	462.2	71.1	0.00	18.49	2.84				
EXISTING RUMBLE STRIPS																	
161+75.00	161+97.00	78.00	0	4	52	8	60	0.0	450.7	69.3	0.00	18.03	2.77				
161+97.00	162+75.00	78.00	0	4	52	8	60	0.0	450.7	69.3	0.00	18.03	2.77				
EXISTING RUMBLE STRIPS																	
162+75.00	162+97.00	78.00	0	4	52	8	60	0.0	450.7	69.3	0.00	18.03	2.77				
162+97.00	163+75.00	78.00	0	4	52	8	60	0.0	450.7	69.3	0.00	18.03	2.77				
EXISTING RUMBLE STRIPS																	
163+75.00	163+97.00	163.00	0	4	52	8	60	0.0	941.8	144.9	0.00	37.67	5.80				
163+97.00	165+60.00	163.00	0	4	52	8	60	0.0	941.8	144.9	0.00	37.67	5.80				
EXISTING RUMBLE STRIPS																	
165+60.00	165+82.00	61.00	0	4	52	8	60	0.0	352.4	54.2	0.00	14.10	2.17				
165+82.00	166+43.00	61.00	0	4	52	8	60	0.0	352.4	54.2	0.00	14.10	2.17				
EXISTING RUMBLE STRIPS																	
166+43.00	166+65.00	53.00	0	4	52	8	60	0.0	306.2	47.1	0.00	12.25	1.88				
166+65.00	167+18.00	53.00	0	4	52	8	60	0.0	306.2	47.1	0.00	12.25	1.88				
EXISTING RUMBLE STRIPS																	
167+18.00	167+40.00	28.00	0	4	52	8	60	0.0	161.8	24.9	0.00	6.47	1.00				
167+40.00	167+68.00	28.00	0	4	52	8	60	0.0	161.8	24.9	0.00	6.47	1.00				
EXISTING RUMBLE STRIPS																	
167+68.00	167+90.00	70.00	0	4	52	35.5	87.5	0.0	404.4	276.1	0.00	16.18	11.04	RAMP NO. 18			
167+90.00	168+60.00	58.00	0	4	52	8	60	0.0	335.1	51.6	0.00	13.40	2.06				
168+60.00	169+18.00	58.00	0	4	52	8	60	0.0	335.1	51.6	0.00	13.40	2.06				
EXISTING RUMBLE STRIPS																	
169+18.00	169+40.00	53.00	0	4	52	8	60	0.0	306.2	47.1	0.00	12.25	1.88				
169+40.00	169+93.00	53.00	0	4	52	8	60	0.0	306.2	47.1	0.00	12.25	1.88				
EXISTING RUMBLE STRIPS																	
169+93.00	170+15.00	28.00	0	4	52	8	60	0.0	161.8	24.9	0.00	6.47	1.00				
170+15.00	170+43.00	28.00	0	4	52	8	60	0.0	161.8	24.9	0.00	6.47	1.00				
EXISTING RUMBLE STRIPS																	
170+43.00	170+65.00	218.78	0	4	52	8	60	0.0	1264.1	194.5	0.00	50.56	7.78				
170+65.00	172+83.78	31.30	0	4	52	8	60	0.0	180.8	27.8	0.00	7.23	1.11				
172+83.78	173+15.08	31.30	0	4	52	8	60	0.0	180.8	27.8	0.00	7.23	1.11				
TOTAL THIS SHEET								2252.4	21618.7	6640.0	90.09	864.74	265.59				

CALCULATED: JRC
 CHECKED: LGM
 ESTIMATED PAVEMENT QUANTITIES
 CUYAHOGA COUNTY
 CUY-90-16.22/VAR.
 19
 54

28-OCT-2000 10:27PM jgm/avee
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PAVEMENT QUANTITIES

ITEM SPECIAL - MISC.: NOVACHIP			NOVACHIP MINIMUM THICKNESS = 80LBS./SQ. YD.										SCL-SPEED CHANGE LANE			
FROM	TO	LENGTH (FT)	INSIDE SHOULDER (FT)	# OF LANES	MAINLINE LANES (FT)	SCL/OUTSIDE SHOULDER (AVERAGE WIDTH) (FT)	TOTAL WIDTH (FT)	INSIDE SHOULDER AREA (SQ YD)	MAINLINE AREA (SQ YD)	OUTSIDE SHOULDER/SCL AREA (SQ YD)	INSIDE SHOULDER ASPHALT (TON)	MAINLINE ASPHALT (TON)	OUTSIDE SHOULDER/SCL ASPHALT (TON)			
1-90 WEST BOUND																
54+90.78	55+97.03	106.25	0	3	36	3.5	39.5	0.0	425.0	41.3	0.00	17.00	1.65			
55+97.03	57+79.00	181.97	0	3	36	11	47	0.0	727.9	222.4	0.00	29.12	8.90			
57+79.00	58+82.25	103.25	0	3	36	23	59	0.0	413.0	263.9	0.00	16.52	10.56	RAMP E-8		
58+82.25	61+13.75	EAST 9th STREET BRIDGE														
61+13.75	62+48.58	134.83	0	3	36	10	46	0.0	539.3	149.8	0.00	21.57	5.99			
62+48.58	64+06.43	157.85	0	3	36	10	46	0.0	631.4	175.4	0.00	25.26	7.02			
64+06.43	65+12.68	106.25	0	3	36	10	46	0.0	425.0	118.1	0.00	17.00	4.72			
65+12.68	68+16.12	VARIOUS RAMPS UNDER I-90														
68+16.12	69+22.39	106.27	0	3	36	10	46	0.0	425.1	118.1	0.00	17.00	4.72			
69+22.39	69+75.25	52.86	0	3	36	10	46	0.0	211.4	58.7	0.00	8.46	2.35			
69+75.25	70+81.50	106.25	0	3	36	10	46	0.0	425.0	118.1	0.00	17.00	4.72			
70+81.50	73+94.00	EAST 14th STREET BRIDGE														
73+94.00	75+00.25	106.25	3.5	3	36	36.5	76	41.3	425.0	430.9	1.65	17.00	17.24	RAMP E-10		
75+00.25	78+66.88	366.63	3.5	3	36	28.5	68	142.6	1466.5	1161.0	5.70	58.66	46.44			
78+66.88	79+85.88	119	3.5	3	36	33.5	73	46.3	476.0	442.9	1.85	19.04	17.72	RAMP E-13		
79+85.88	83+09.31	323.43	5	3	36	11.5	52.5	179.7	1293.7	413.3	7.19	51.75	16.53			
83+09.31	98+00.00	STATION EQUATION: 83+09.31 BK=98+00.00 AH														
98+00.00	108+20.00	1020	5	3	36	11.5	52.5	566.7	4080.0	1303.3	22.67	163.20	52.13			
108+20.00	113+00.00	480	5.75	3	36	17.25	59	306.7	1920.0	920.0	12.27	76.80	36.80			
113+00.00	115+00.00	200	5.75	3	36	32.25	74	127.8	800.0	716.7	5.11	32.00	28.67	RAMP No. 5		
115+00.00	117+40.00	240	5.75	3	36	10.75	52.5	153.3	960.0	286.7	6.13	38.40	11.47			
117+40.00	119+00.00	160	5.75	3	36	42.25	84	102.2	640.0	751.1	4.09	25.60	30.04	RAMP No. 6		
119+00.00	127+09.87	809.87	5.75	4	48	10.75	64.5	517.4	4319.3	967.3	20.70	172.77	38.69			
127+09.87	126+61.13	STATION EQUATION: 127+09.873 BK=126+61.130 AH														
126+61.13	127+30.00	68.87	5.75	4	48	10.75	64.5	44.0	367.3	82.3	1.76	14.69	3.29			
127+30.00	128+80.00	150	5.75	4	48	18.25	72	95.8	800.0	304.2	3.83	32.00	12.17	RAMP No. 10		
128+80.00	132+50.00	370	6.5	4	48	10	64.5	249.2	1840.0	383.3	9.97	73.60	15.33			
132+50.00	134+50.00	225	6.5	4	48	25	79.5	162.5	1200.0	625.0	6.50	48.00	25.00	RAMP No. 11		
134+50.00	139+00.00	450	5.75	4	48	10.75	64.5	287.5	2400.0	537.5	11.50	96.00	21.50			
139+00.00	140+70.00	170	6.5	4	48	17.5	72	122.8	906.7	330.6	4.91	36.27	13.22	RAMP No. 13		
140+70.00	151+07.08	1037.08	5.3	3	40	9.2	54.5	610.7	4609.2	1060.1	24.43	184.37	42.40			
151+07.08	153+65.00	257.92	4.5	3	40	15	59.5	129.0	1146.3	429.9	5.16	45.85	17.20			
153+65.00	154+91.00	126	4.5	4	52	27.5	84	63.0	728.0	385.0	2.52	29.12	15.40	RAMP No. 14		
154+91.00	160+95.00	604	3.75	4	52	8.75	64.5	251.7	3489.8	587.2	10.07	139.59	23.49			
160+95.00	161+70.00	75	0	4	52	9.9	61.9	0.0	433.3	82.5	0.00	17.33	3.30			
161+70.00	166+90.00	520	0	4	52	8.75	60.75	0.0	3004.4	505.6	0.00	120.18	20.22			
166+90.00	167+40.00	50	0	4	52	15.5	67.5	0.0	288.9	86.1	0.00	11.56	3.44	RAMP No. 17		
167+40.00	172+83.78	543.78	0	4	52	8.75	60.75	0.0	3141.8	528.7	0.00	125.67	21.15	SHOREWAY CONNECTION		
172+83.78	173+15.03	31.25	0	4	52	8.75	60.75	0.0	180.6	30.4	0.00	7.22	1.22			
TOTAL THIS SHEET								4200.2	45139.9	14617.4	168.01	1805.60	584.69			
TOTAL SHEET 19								2252.4	21618.7	6640.0	90.09	864.74	265.59			
TOTAL SHEET 18								2493.3	21628.5	8704.8	99.74	865.16	348.18			
TOTAL ALL SHEETS								8945.9	88387.1	29962.2	357.84	3535.50	1198.46			
GRAND TOTAL (CARRIED TO GENERAL SUMMARY)								5091.80 TON								

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CALCULATE JRC CHECKED LGM
 ESTIMATED PAVEMENT QUANTITIES
 CUYAHOGA COUNTY
 CUY-90-16.22/VAR.
 20
 54

PAVEMENT QUANTITIES

RESURFACING QUANTITIES											
					202	407		446			
LOCATION		LENGTH LIN FT	AVERAGE END WIDTH LIN FT	SURFACE AREA SQ YDS	WEARING COURSE REMOVED SQ YD	TACK COAT GALLON	TACK COAT FOR INTERMEDIATE COURSE GALLON	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN CU YD			
FROM	TO				SQ YD	GALLON	GALLON	CU YD	CU YD		
RAMP E-3											
6+60	2+56	404	33	1481	1481	148	74	61.7	82.3		
2+56	2+03	53	37	218	218	22	11	9.1	12.1		
2+03	1+15	88	24	235	235	23	12	9.8	13.1		
1+15	0+30	85	17	161	161	16	8	6.7	8.9		
RAMP E-3 CONN.											
2+07	1+25	82	17	155	155	15	8	6.5	8.6		
1+25	0+62	63	19	133	133	13	7	5.5	7.4		
RAMP E-4											
2+62	8+45	583	25	1619	1619	162	81	67.5	89.9		
8+45	9+20	75	20	167	167	17	8	6.9	9.3		
RAMP E-5											
12+23	11+50	73	28	227	227	23	11	9.5	12.6		
11+50	9+61	189	38	798	798	80	40	33.3	44.3		
9+61	2+50	711	27	2133	2133	213	107	88.9	118.5		
2+50	2+10	40	43.5	193	193	19	10	8.1	10.7		
RAMP E-6											
1+98	4+48	250	32.5	903	903	90	45	37.6	50.2		
4+48	5+68	120	50	667	667	67	33	27.8	37.1		
5+68	8+22	254	30	847	847	85	42	35.3	47.1		
8+22	9+63	141	26	407	407	41	20	17.0	22.6		
9+63	10+38	75	18	150	150	15	8	6.3	8.3		
RAMP E-10											
3+84	8+20	436	37	1792	1792	179	90	74.7	99.6		
RAMP E-11											
1+98	6+67	469	27	1407	1407	141	70	58.6	78.2		
RAMP E-11 CONN.											
6+00	6+75	75	20	167	167	17	8	6.9	9.3		
RAMP E-13											
0+30	1+01	75	63	525	525	53	26	21.9	29.2		
1+01	1+21	20	31	69	69	7	3	2.9	3.8		
1+21	4+64	343	25.5	972	972	97	49	40.5	54.0		
4+64	4+96	32	25	89	89	9	4	3.7	4.9		
RAMP E-16											
1+82	4+87	305	27	915	915	92	46	38.1	50.8		
4+87	5+11	24	27.5	73	73	7	4	3.1	4.1		
5+11	6+51	140	28	436	436	44	22	18.1	24.2		
RAMP NO. 3											
3+30	8+30	500	32	1778	1778	178	89	74.1	98.8		
8+30	8+80	50	28	156	156	16	8	6.5	8.7		
8+80	9+22	42	26.5	124	124	12	6	5.2	6.9		
RAMP NO. 4											
1+88	7+93	605	26	1748	1748	175	87	72.8	97.1		
7+93	8+49	56	34	212	212	21	11	8.8	11.8		
RAMP NO. 5											
0+89	6+37	548	27	1644	1644	164	82	68.5	91.3		
6+37	6+62	25	25	69	69	7	3	2.9	3.8		

RESURFACING QUANTITIES											
					202	407		446			
LOCATION		LENGTH LIN FT	AVERAGE END WIDTH LIN FT	SURFACE AREA SQ YDS	WEARING COURSE REMOVED SQ YD	TACK COAT GALLON	TACK COAT FOR INTERMEDIATE COURSE GALLON	ASPHALT CONCRETE SURFACE COURSE, TYPE 1H, AS PER PLAN CU YD			
FROM	TO				SQ YD	GALLON	GALLON	CU YD	CU YD		
RAMP NO. 6											
1+55	6+50	495	32	1760	1760	176	88	73.3	97.8		
6+50	7+40	90	33	330	330	33	17	13.8	18.3		
RAMP NO. 7											
2+15	7+27	512	32	1820	1820	182	91	75.9	101.1		
7+27	8+10	83	32	295	295	30	15	12.3	16.4		
RAMP NO. 8											
1+35	7+05	570	26	1647	1647	165	82	68.6	91.5		
RAMP NO. 9											
2+35	8+35	600	24	1600	1600	160	80	66.7	88.9		
8+35	9+10	75	32	267	267	27	13	11.1	14.8		
RAMP NO. 10											
1+55	5+09	354	26	1023	1023	102	51	42.6	56.8		
5+09	6+67	158	18	316	316	32	16	13.2	17.6		
6+67	7+42	75	31	258	258	26	13	10.8	14.3		
RAMP NO. 10 CONN.											
5+09	6+37	128	17	242	242	24	12	10.1	13.4		
6+37	8+34	197	26	569	569	57	28	23.7	31.6		
8+34	8+55	21	18	42	42	4	2	1.8	2.3		
RAMP NO. 11											
2+25	8+18	593	32	2108	2108	211	105	87.9	117.1		
8+18	8+92	74	30	247	247	25	12	10.3	13.7		
RAMP NO. 12											
2+71	4+06	135	32	480	480	48	24	20.0	26.7		
4+06	5+25	119	46	608	608	61	30	25.3	33.8		
5+25	7+90	265	32	942	942	94	47	39.3	52.3		
RAMP NO. 12A											
5+25	6+22	97	33	356	356	36	18	14.8	19.8		
6+22	7+79	157	32	558	558	56	28	23.3	31.0		
7+79	8+69	90	31	310	310	31	16	12.9	17.2		
RAMP NO. 13											
1+70	6+01	431	24	1149	1149	115	57	47.9	63.8		
6+01	6+41	40	32	142	142	14	7	5.9	7.9		
6+41	7+57	116	24	309	309	31	15	12.9	17.2		
7+57	8+02	45	40	200	200	20	10	8.3	11.1		
RAMP NO. 14											
2+17	3+75	158	24	421	421	42	21	17.6	23.4		
3+75	4+66	91	34	344	344	34	17	14.3	19.1		
4+66	7+85	319	24	851	851	85	43	35.4	47.3		
RAMP NO. 14A											
4+66	5+43	77	24	205	205	21	10	8.6	11.4		
5+43	6+95	152	21	355	355	35	18	14.8	19.7		
RAMP NO. 15											
1+88	3+26	138	22.5	345	345	35	17	14.4	19.2		
3+26	7+46	420	24	1120	1120	112	56	46.7	62.2		
7+46	8+06	60	45	300	300	30	15	12.5	16.7		
TOTAL THIS SHEET					44189	4422	2207	1841.8	2454.9		

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CALCULATED
JRC
CHECKED
LGM

ESTIMATED PAVEMENT QUANTITIES

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

* TONNAGE IS BASED UPON USING 80 LBS/SQ.YD.

** COMPUTER GENERATED

ESTIMATED PAVEMENT REPAIR QUANTITIES									
LOCATION STATION		END WIDTHS	LENGTH	SURFACE AREA	254		SPEC.		
					PAVEMENT PLANING, BITUMINOUS (T-3/4')		MISC.: NOVACHIP		
FROM	TO	LIN FT	LIN FT	SQ YDS	SQ.YD.		*TON		
RAMP C-1 (IR-77)									
38+53.07	39+53.07	29-22	100	283.33	283		11.3		
39+53.07	54+20.07	22	1467	3586	3586		143.4		
54+20.07	54+74			**224.78	225		9.0		
RAMP C-2 (IR-77)									
32+50	36+56	32-42	406	1669.11	1669		66.8		
36+56	47+23.15	22	1067.15	2608.59	2609		104.3		
47+23.15	48+20			**400	400		16.0		
RAMP C-3 (IR-77)									
34+64.65	35+64.65	29-22	100	283.33	283		11.3		
35+64.65	46+63	22	1098.35	2684.86	2685		107.4		
46+63	49+17			**800	800		32.0		
RAMP C-4 (IR-77)									
34+58.19	44+29.83	22	971.64	2375.12	2375		95.0		
44+29.83	45+29.83	22-29	100	283.33	283		11.3		
RAMP C-5 (IR-77)									
47+62.44	48+62.44	29-22	100	283.33	283		11.3		
48+62.44	58+75.22	22	1012.78	2475.68	2476		99.0		
58+75.22	60+50			**666.67	667		26.7		
RAMP C-6 (IR-77)									
43+54.90	53+70.01	22	1015.11	2481.38	2481		99.3		
53+70.01	54+70.01	22-29	100	283.33	283		11.3		
TOTAL CARRIED TO THE GENERAL SUMMARY					21388		855.4		

ESTIMATED PAVEMENT REPAIR QUANTITIES										
LOCATION STATION		END WIDTHS	LENGTH	SURFACE AREA	202		407		446	
					WEARING COURSE REMOVED (T-3 3/4")		TACK COAT	TAC COAT FOR INTERMEDIATE COURSE	1/2" SURFACE COURSE, TYPE 1H, AS PER PLAN	INTERMEDIATE COURSE TYPE 2, P664-28, VARIABLE THICKNESS (2" NOMINAL)
FROM	TO	LIN FT	LIN FT	SQ YDS	SQ.YD.	GALLON	GALLON	CU.YD.	CU.YD.	
RAMP C-3 (IR-77)										
49+17	49+42	27	25	75	75	8	4	3	4	
TOTAL TO GENERAL SUMMARY					75	8	4	3	4	

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CALCULATED LGM CHECKED JRC

PAVEMENT REPAIR ESTIMATED QUANTITIES

CUYAHOGA COUNTY CUY-480-0.00/VAR.

TRAFFIC CONTROL QUANTITIES

CALCULATED
JRC
CHECKED
LGM

		PAVEMENT MARKINGS																		
		LOCATION		ITEM 828																
	ROADWAY	FROM STATION	TO STATION	EDGE LINES (WHITE)	EDGE LINES (YELLOW)	LANE LINES (WHITE)	8" CHANNELIZING LINE (WHITE)										24" TRANSVERSE LINE (WHITE)		4" DOTTED LINES	
				LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT								
	I-90 W.B.	54+90	58+36	346	346	692														
		58+36	58+76	40	40	120														
		58+76	59+05	58	29	58	29													
		59+05	73+24	1,419	1,419	2,838														
		73+24	74+25	-	101	202	202									136				
		Ⓐ 74+25	108+20	1,904	1,904	3,808														
		108+20	113+70	550	550	1,100													550	
		113+70	114+10	40	40	120														
		114+10	115+00	180	90	180	90													
		115+00	117+43	243	243	486														
		117+43	118+28	85	85	170	170									181				
		118+28	119+00	72	72	144	72													
		119+00	121+40	240	240	720														
		121+40	125+39	399	399	798													399	
		125+39	127+30	240	240	720														
		Ⓑ 127+30	128+19	178	89	178	89													
		128+19	131+80	361	361	722														
		131+80	133+63	183	183	366	366									357				
		133+63	134+50	87	87	174	87													
		134+50	135+70	120	120	360														
		135+70	137+80	210	210	420													210	
		137+80	139+00	120	120	360														
		139+00	140+58	316	158	316	158													
		140+58	153+78	1,320	1,320	2,640														
		153+78	155+25	147	147	294	294									397				
		155+25	158+50	325	325	650	325													
		158+50	167+17	867	867	2,601														
		167+17	167+51	68	34	102	34													
		167+51	171+64	413	413	1,239														
		171+64	172+64	100	100	200	100													
		172+64	173+15	102	51	102	51													
SUBTOTALS (THIS SHEET)				10,733	10,383	22,880	2067									1071			1159	
TOTALS CARRIED TO GENERAL SUMMARY				4.00 MI.		4.33 MI.		2067 LIN.FT.							1071 LIN.FT.				1159 LIN.FT.	

Ⓐ STATION EQUATION STA. 83+09.31 TO BK - STA. 98+00 AH Ⓑ STATION EQUATION STA. 127+09.87 BK - STA. 126+61.13 AH Ⓒ STATION EQUATION STA. 173+15.03 BK - STA. 73+15.03 AH

ESTIMATED TRAFFIC CONTROL QUANTITIES

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

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TRAFFIC CONTROL QUANTITIES

CALCULATE
 JRC
 CHECKED
 LGM

		PAVEMENT MARKINGS																					
	ROADWAY	LOCATION		828		828	828																
		FROM STATION	TO STATION	EDGE LINES (WHITE)	EDGE LINES (YELLOW)	4" LANE LINE	8" CHANNELIZING LINE (WHITE)	8" EDGE LINE (YELLOW)	12" TRANSVERSE LINE (WHITE)	12" TRANSVERSE LINE (YELLOW)	24" TRANSVERSE LINE (WHITE)	24" TRANSVERSE LINE (YELLOW)	24" STOP LINE	4" DOTTED LINES	6" DOTTED LINES	CROSSWALK LINE	LANE ARROWS	WORD "ONLY" ON PAVEMENT					
				LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH	EACH	
	RAMP E-3	0+62	0+86	24							48		20										
		0+86	2+03	117	117																		
		2+03	6+60	457	457																		
	RAMP E-3A	0+64																					
		0+67	2+03	136	136																64		
	RAMP E-4	2+39	9+20	681	681																		
	RAMP E-5	1+13	1+45	32	-						32												
		1+45	2+50	105	-						210		154										
		2+50	9+62	712	712																		
		9+62	10+07	45	45						90												
		10+07	12+23	216	216																		
	RAMP E-6	1+93	5+13	320	320																		
		5+13	5+68	55	55						110				74								
		5+68	10+38	470	470																		
TOTAL THIS SHEET				3370	3209						490		174		74						64		

ESTIMATED TRAFFIC CONTROL QUANTITIES

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

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TRAFFIC CONTROL QUANTITIES

CALCULATE
 JRC
 CHECKED
 LGM

ROADWAY		LOCATION		PAVEMENT MARKINGS																					
				828		828		828						828		828		828		828		828		828	
				EDGE LINES (WHITE)	EDGE LINES (YELLOW)	4" LANE LINE			8" CHANNELIZING LINE (WHITE)	8" EDGE LINE (YELLOW)	12" TRANSVERSE LINE (WHITE)	12" TRANSVERSE LINE (YELLOW)	24" TRANSVERSE LINE (WHITE)	24" TRANSVERSE LINE (YELLOW)	24" STOP LINE	4" DOTTED LINES	6" DOTTED LINES	CROSSWALK LINE	LANE ARROWS	WORD "ONLY" ON PAVEMENT					
		FROM STATION	TO STATION	LIN FT	LIN FT	LIN FT			LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH	EACH			
RAMP E-10		0+00	0+17	17	17																				
		0+17	1+73	156	-					156															
		1+73	2+73	100	100					100															
		2+73	8+25	552	552	552																			
RAMP E-16		0+40	1+80	470	140																				
		1+80	6+50	470	470																				
RAMP E-11		1+95	4+08	213	213																				
		4+08	4+88	80	80	80																			
		4+88	5+95	107	107					107											2	1			
		5+95	6+10	15	15					45		13													
		6+10	6+49	39	39					39												2			
			6+51																						
			6+58																						
RAMP E-11A		6+10	6+77	67	67																				
RAMP E-13			6+80																						
			0+34							62		42													
		0+41	1+76	135	135	135																			
		1+76	4+96	320																					
		4+96	5+76	80																					
		5+76	9+70	394	394																				
TOTAL THIS SHEET				2745	2329	767				509	800	55			405	24	320			264	5	1			

ESTIMATED TRAFFIC CONTROL QUANTITIES

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

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TRAFFIC CONTROL QUANTITIES

PAVEMENT MARKINGS																						
ROADWAY	LOCATION		828		828		828				828		828		828		828		828		828	
	FROM STATION	TO STATION	EDGE LINES (WHITE)	EDGE LINES (YELLOW)	4" LANE LINES	8" CHANNELIZING LINES (WHITE)	8" CHANNELIZING LINES (YELLOW)	12" TRANSVERSE LINES (WHITE)	12" TRANSVERSE LINES (YELLOW)	24" TRANSVERSE LINES (WHITE)	24" TRANSVERSE LINES (YELLOW)	24" STOP LINE	4" DOTTED LINES	6" DOTTED LINES	CROSSWALK LINES	LANE ARROWS	WORD "ONLY" ON PAVEMENT					
	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH	EACH
RAMP NO. 3	2+69	4+52	183	183																		
	4+52	6+52	200	200	200																4	2
	6+52	8+80	255	195						228												
		8+82 8+97											60									122
RAMP NO. 4	1+35	8+42	707	707																		
		8+45																				110
RAMP NO. 5	0+90	6+36	546	546																		
		6+40																				66
	6+37	6+46								18		7										
RAMP NO. 6	1+57	3+67	210	210																		
	3+67	7+22	355	355						355											6	4
		7+24 7+31																				80
RAMP NO. 7	2+16	5+16	300	300																		
	5+16	5+96	80	80																		
	5+96	7+89	193	193						193											4	2
		7+91 7+99																				68
RAMP NO. 8	1+32	6+91	559	559																		
		6+94 6+90																				64
RAMP NO. 9	2+25	8+97	672	672																		
		9+00																				82
RAMP NO. 10	0+89	5+70	481	481																		
	5+70	5+80	20	10																		
	5+80	7+37	157	157						10												
RAMP NO. 10A	5+77	8+36	259	259																		
		8+41 8+35																				68
RAMP NO. 11	2+70	6+36	366	366																		
	6+36	8+67	231	231						231												4
		8+69 8+92																				170
TOTAL THIS SHEET			5774	5704	200					1135		49				144				830	18	9

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CALCULATE
 JRC
 CHECKED
 LGM

ESTIMATED TRAFFIC CONTROL QUANTITIES

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

TRAFFIC CONTROL QUANTITIES

CALCULATE
 JRC
 CHECKED
 LGM

REFERENCE NO.	PAVEMENT MARKINGS																					
	LOCATION		828		828		828		828		828		828		828		828		828		828	
	ROADWAY	FROM STATION	TO STATION	EDGE LINES (WHITE)	EDGE LINES (YELLOW)	4" LANE LINES	CENTER LINE (DOUBLE YELLOW)	8" CHANNELIZING LINE (WHITE)	8" EDGE LINE (YELLOW)	12" TRANSVERSE LINE (WHITE)	12" TRANSVERSE LINE (YELLOW)	24" TRANSVERSE LINE (WHITE)	24" TRANSVERSE LINE (YELLOW)	24" STOP LINE	4" DOTTED LINE	CROSSWALK LINES	LANE ARROWS	WORD "ONLY" ON PAVEMENT	ISLAND MARKINGS (YELLOW)	828	828	
			LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	SQ. FT.	
	RAMP NO. 17	1+12	8+94	769	769										15							
	RAMP NO. 18	1+08	1+73	65																		
		1+73	7+20	547	547																	
		7+20	7+47	27	27			54		29												
		7+47	9+39	192	192																	
		9+39	9+50	11				11														
		9+50	10+26	76																		
	RAMP NO. 18A	7+48	8+51	103	103																	
		8+53													16							
	EAST 33rd. St.	0+43																		112		
		0+50													34							
		0+52	0+78				26			26											2	
		0+78	1+06				28															
		1+06	1+51				45															
		1+51	1+62				11			11											45	
		1+62	3+11				149															
	RAMP C-1 (IR-77)	38+53.07	54+74	1621	1621																	
	RAMP C-2 (IR-77)	32+50	48+52.02	1602	1602																	
	RAMP C-3 (IR-77)	34+64.65	49+42	1477	1477																	
	RAMP C-4 (IR-77)	34+58.19	45+29.83	1072	1072																	
	RAMP C-5 (IR-77)	47+62.44	60+50	1288	1288																	
	RAMP C-6 (IR-77)	43+54.90	54+70.01	1115	1115																	
	TOTAL THIS SHEET			9965	9813		259			102		29			65	45			112	2		
	TOTAL SHEET 29			3664	3336		400		144	676	656		256	186	82				692	13	6	
	TOTAL SHEET 28			5774	5704		200			1135		49			144				830	18	9	
	TOTAL SHEET 27			2745	2329		767			509	800	55			405	24	320		264	5	1	
	TOTAL SHEET 26			3370	3209					490		174		74					64			
	SUBTOTAL			25518	24391		1367	403		2912	1456	307		330	591	315	365		1962	38	16	
	GRAND TOTAL (CARRIED TO GENERAL SUMMARY)		9.45 MI.			0.26 MI.	0.03 MI			2912	0.28 MI		1228		315	365			1962	38	16	

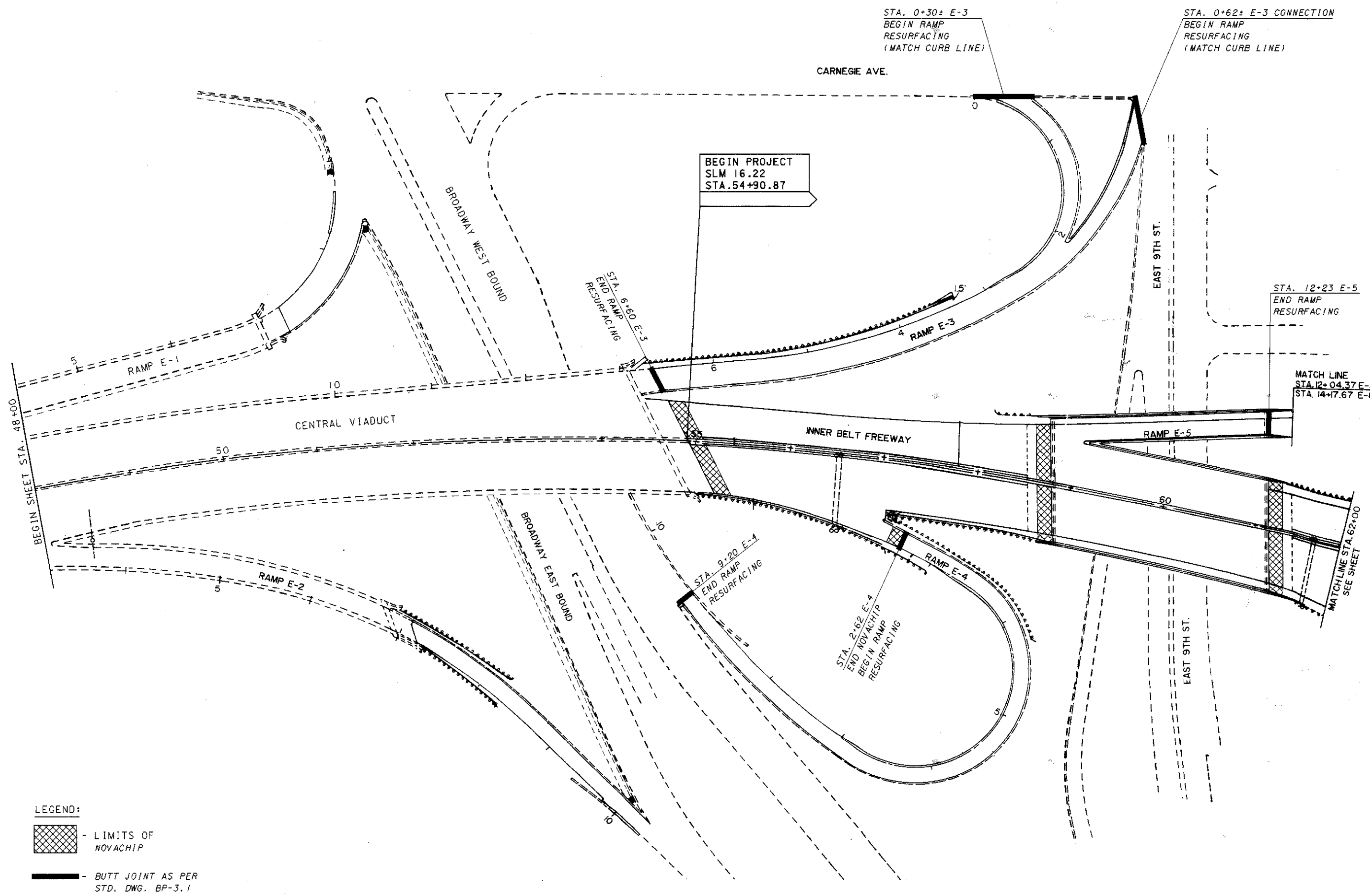
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ESTIMATED TRAFFIC CONTROL QUANTITIES


CUYAHOGA COUNTY
 CUY-90-16.22/AR.


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40



LEGEND:

 - LIMITS OF NOVACHIP

 - BUTT JOINT AS PER STD. DWG. BP-3.1

STA. 0+30± E-3
 BEGIN RAMP
 RESURFACING
 (MATCH CURB LINE)

STA. 0+62± E-3 CONNECTION
 BEGIN RAMP
 RESURFACING
 (MATCH CURB LINE)

BEGIN PROJECT
 SLM 16.22
 STA. 54+90.87

STA. 6+60 E-3
 END RAMP
 RESURFACING

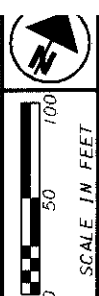
STA. 12+23 E-5
 END RAMP
 RESURFACING

MATCH LINE
 STA. 12+04.37 E-5
 STA. 14+17.67 E-8

STA. 9+20 E-4
 END RAMP
 RESURFACING

STA. 2+62 E-4
 END NOVACHIP
 BEGIN RAMP
 RESURFACING

MATCH LINE STA. 62+00
 SEE SHEET

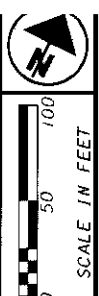
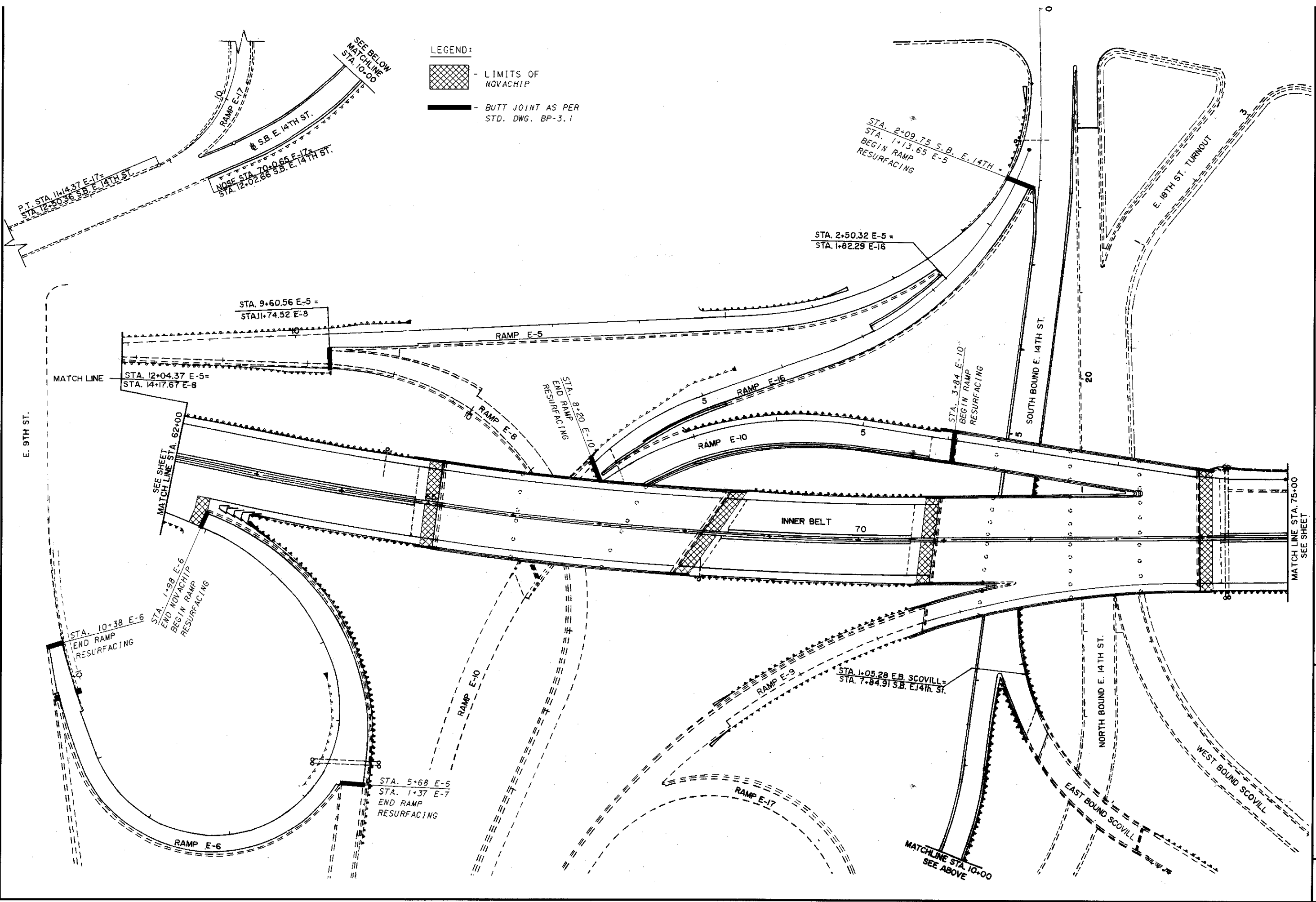


DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
		LGN

PLAN SHEET
 I-90 / INNERBELT FREEWAY
 STA. 48+00 TO STA. 62+00

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

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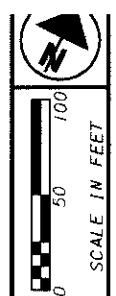
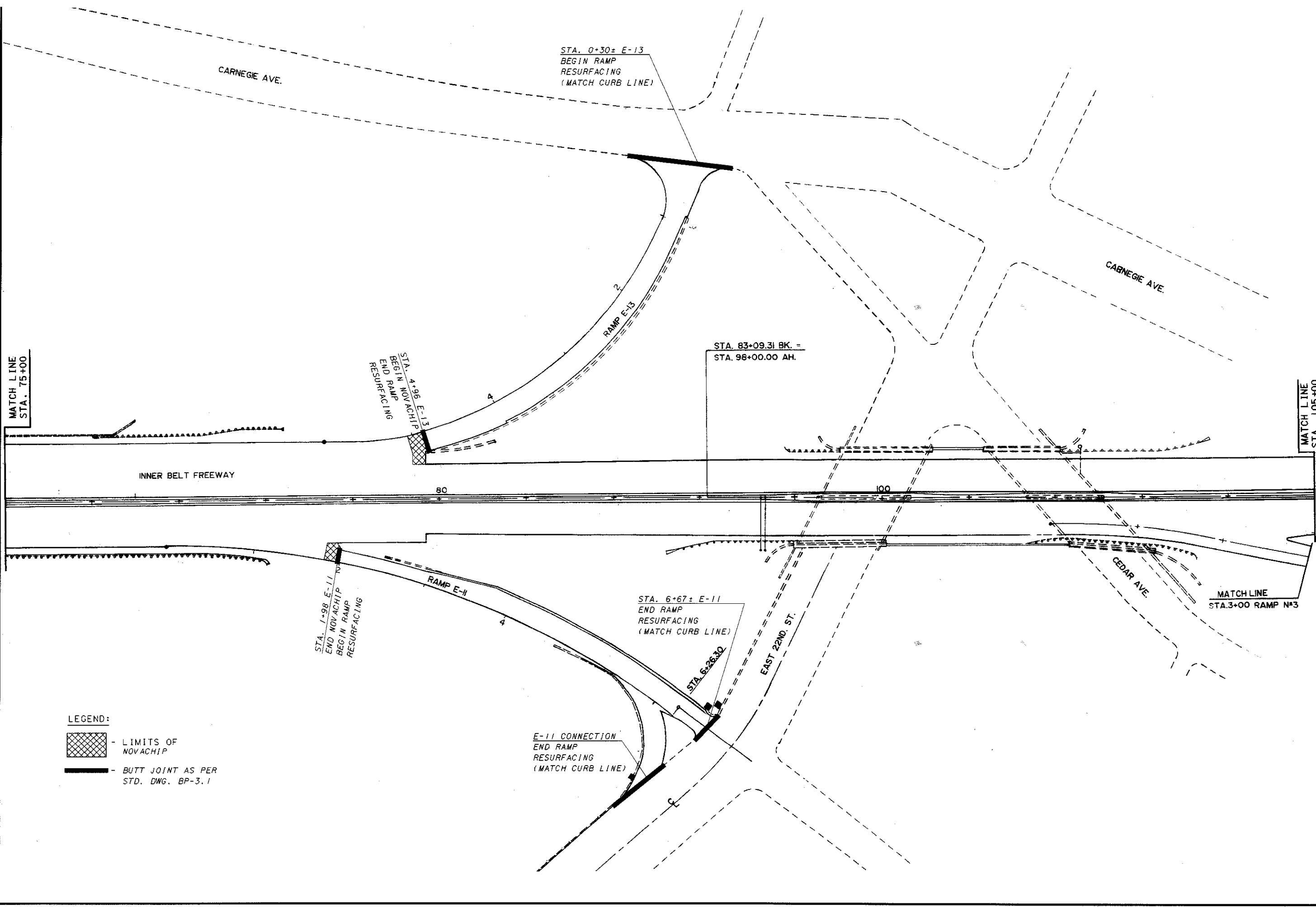
DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
	LGM	

PLAN SHEET
 I-90 / INNERBELT FREEWAY
 STA. 62+00 TO STA. 75+00

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

33
 54



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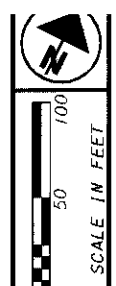


DRAWN	JRC
REVISIONS	
CALCULATED	JRC
CHECKED	LGM

PLAN SHEET
 IR-90 / INNERBELT FREEWAY
 STA. 75+00 TO STA. 105+00

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

LEGEND:
 LIMITS OF NOVACHIP
 BUTT JOINT AS PER STD. DWG. BP-3.1

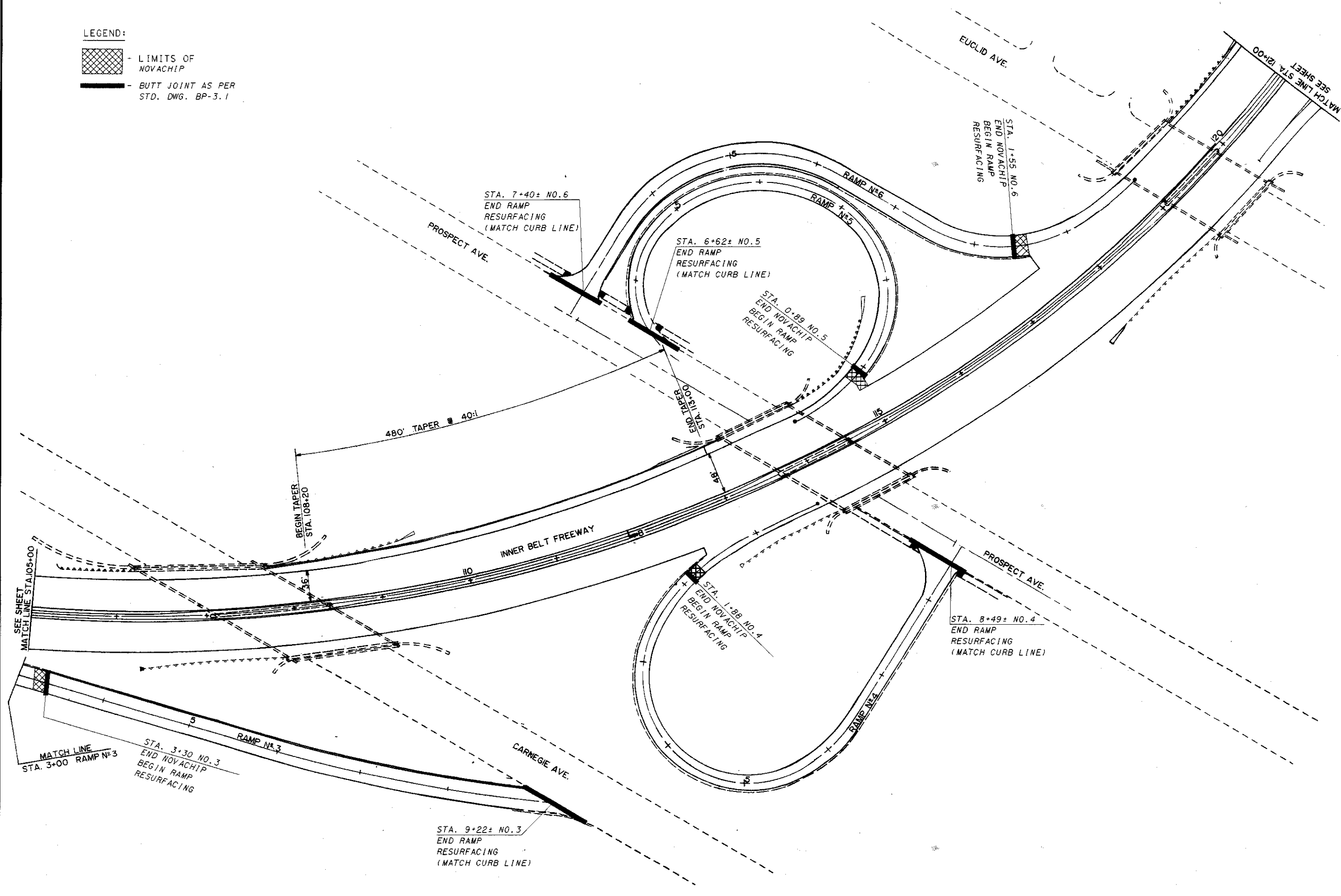


DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
		LGM

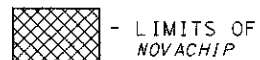
PLAN SHEET
 IR-90 / INNERBELT FREEWAY
 STA. 105+00 TO STA. 121+00

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

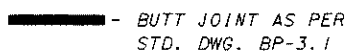
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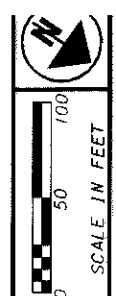
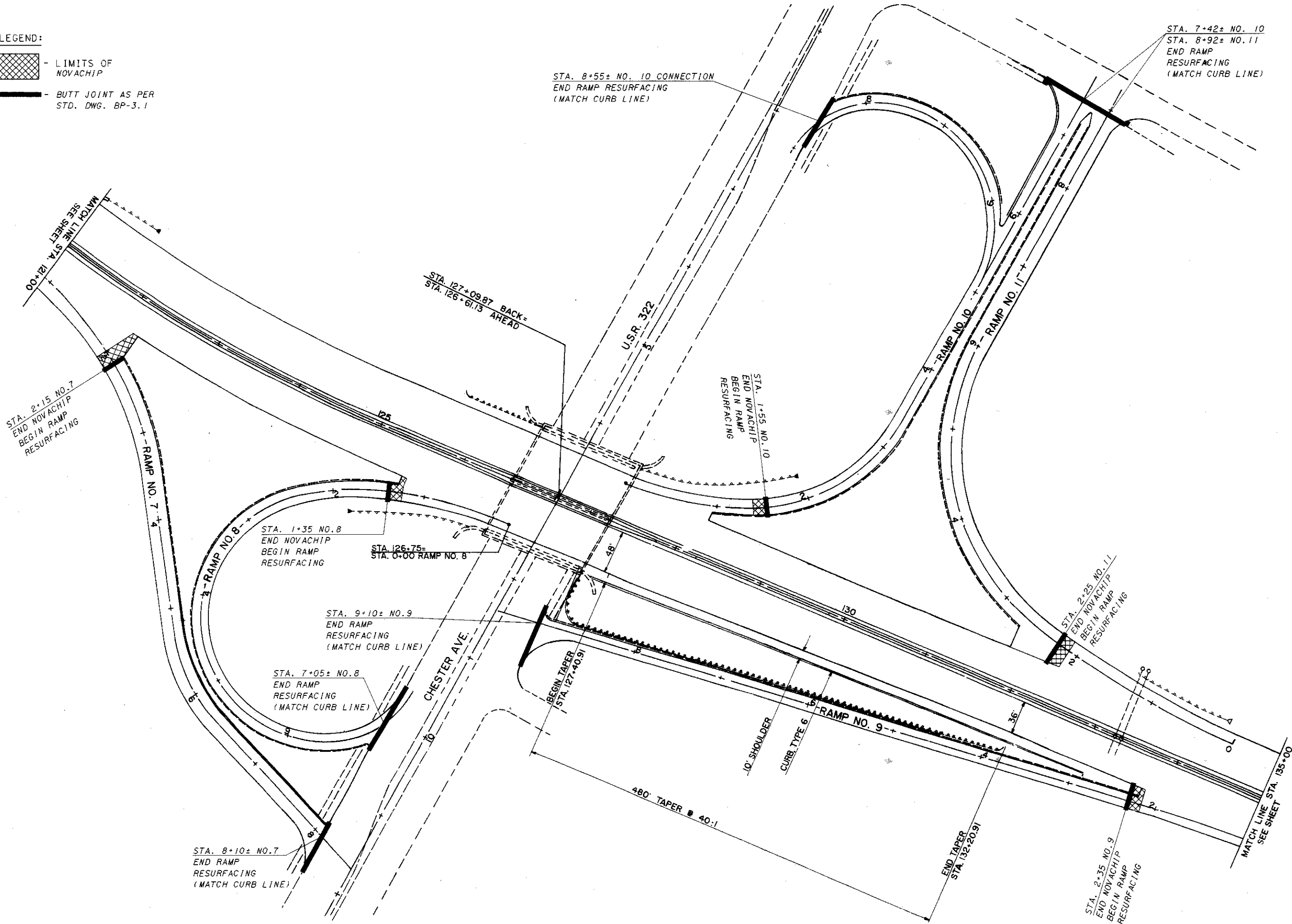
LEGEND:



LIMITS OF NOVACHIP



BUTT JOINT AS PER STD. DWG. BP-3.1

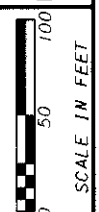


DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
		LGM

PLAN SHEET
 I-90 / INNERBELT FREEWAY
 STA. 121+00 TO STA. 135+00

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

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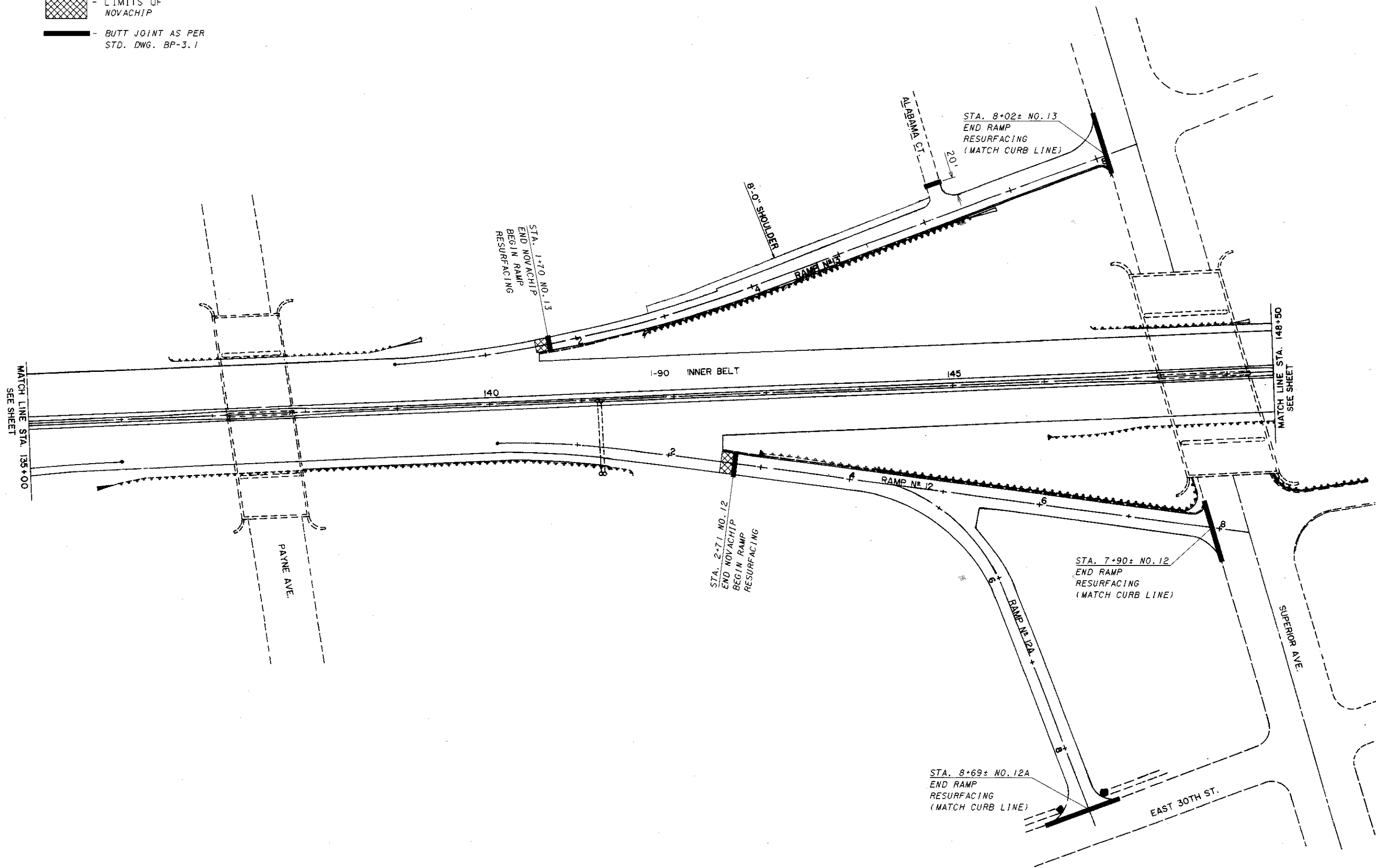
DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
		LGM

PLAN SHEET
 I-90 / INNERBELT FREEWAY
 STA. 135+00 TO STA. 148+50

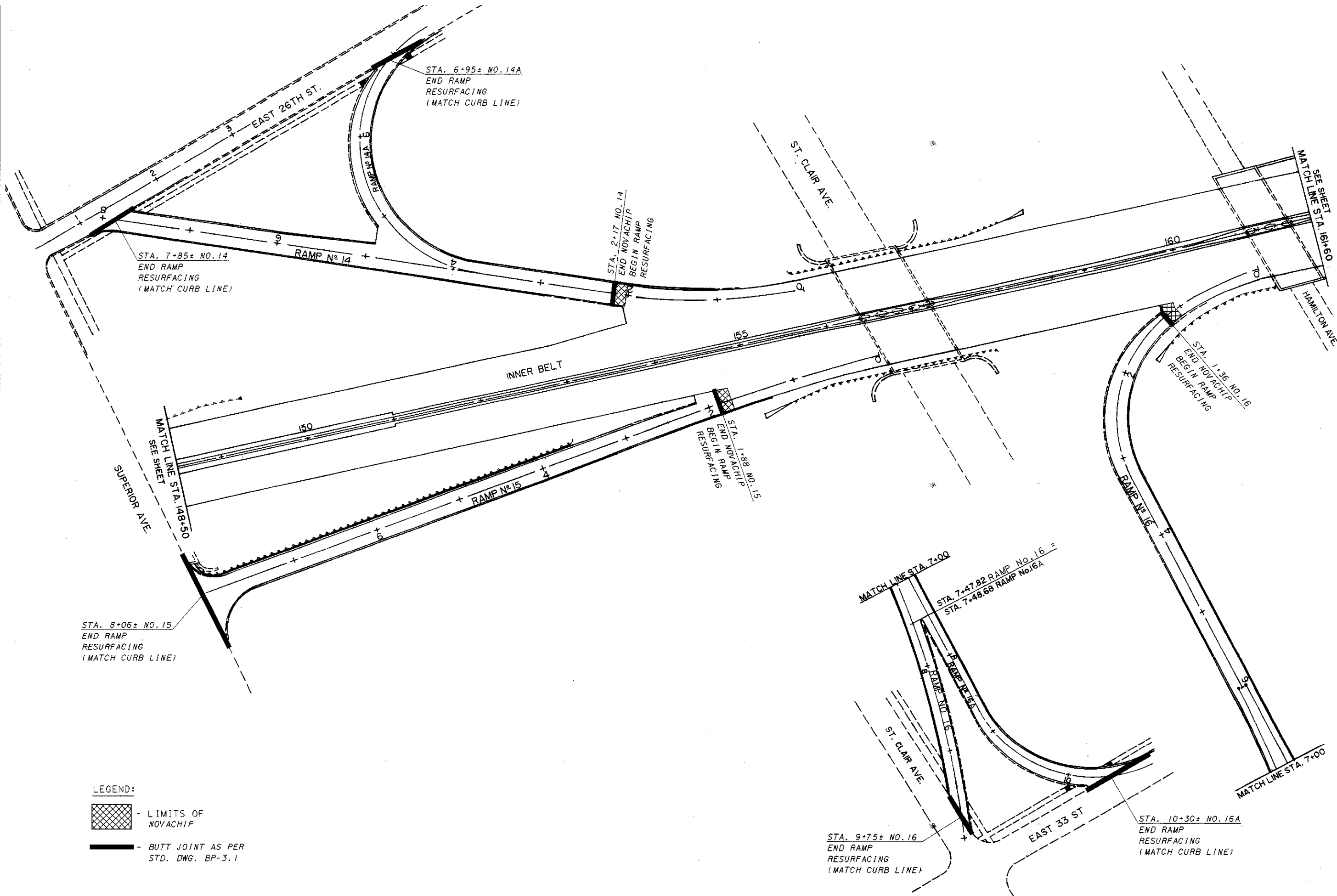
CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

LEGEND:



- LIMITS OF NOVACHIP
- BUTT JOINT AS PER STD. DWG. BP-3.1

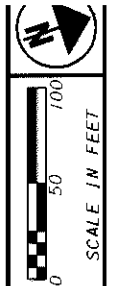


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LEGEND:

-  - LIMITS OF NOVACHIP
-  - BUTT JOINT AS PER STD. DWG. BP-3.1

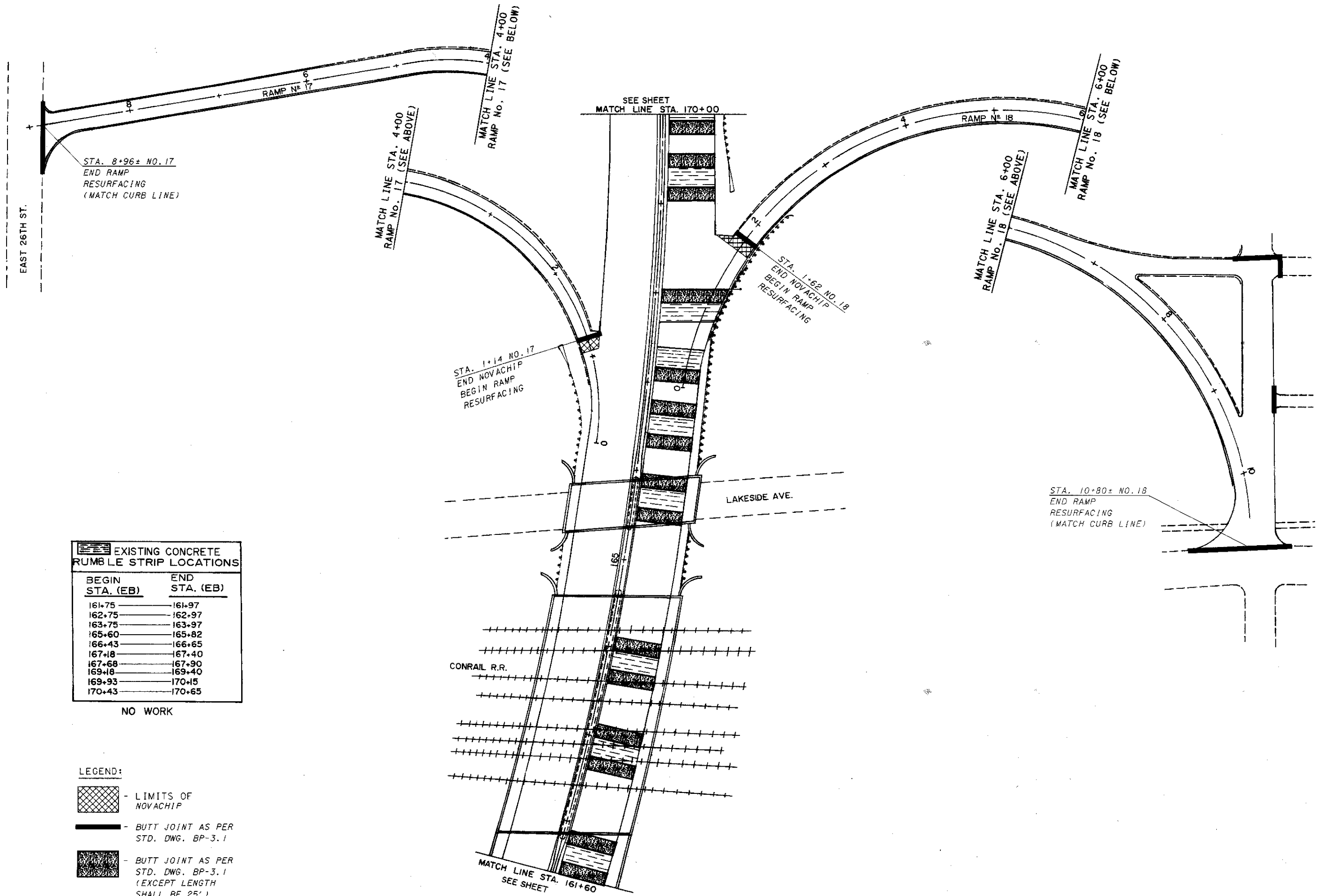


DRAWN	JRC
CHECKED	LGM
CALCULATED	JRC
REVISED	

PLAN SHEET
 IR-90 / INNERBELT FREEWAY
 STA. 148+50 TO STA. 161+60

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

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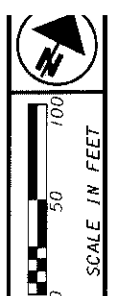
EXISTING CONCRETE RUMBLE STRIP LOCATIONS

BEGIN STA. (EB)	END STA. (EB)
161+75	161+97
162+75	162+97
163+75	163+97
165+60	165+82
166+43	166+65
167+18	167+40
167+68	167+90
169+18	169+40
169+93	170+15
170+43	170+65

NO WORK

LEGEND:

-  - LIMITS OF NOVACHIP
-  - BUTT JOINT AS PER STD. DWG. BP-3.1
-  - BUTT JOINT AS PER STD. DWG. BP-3.1 (EXCEPT LENGTH SHALL BE 25')

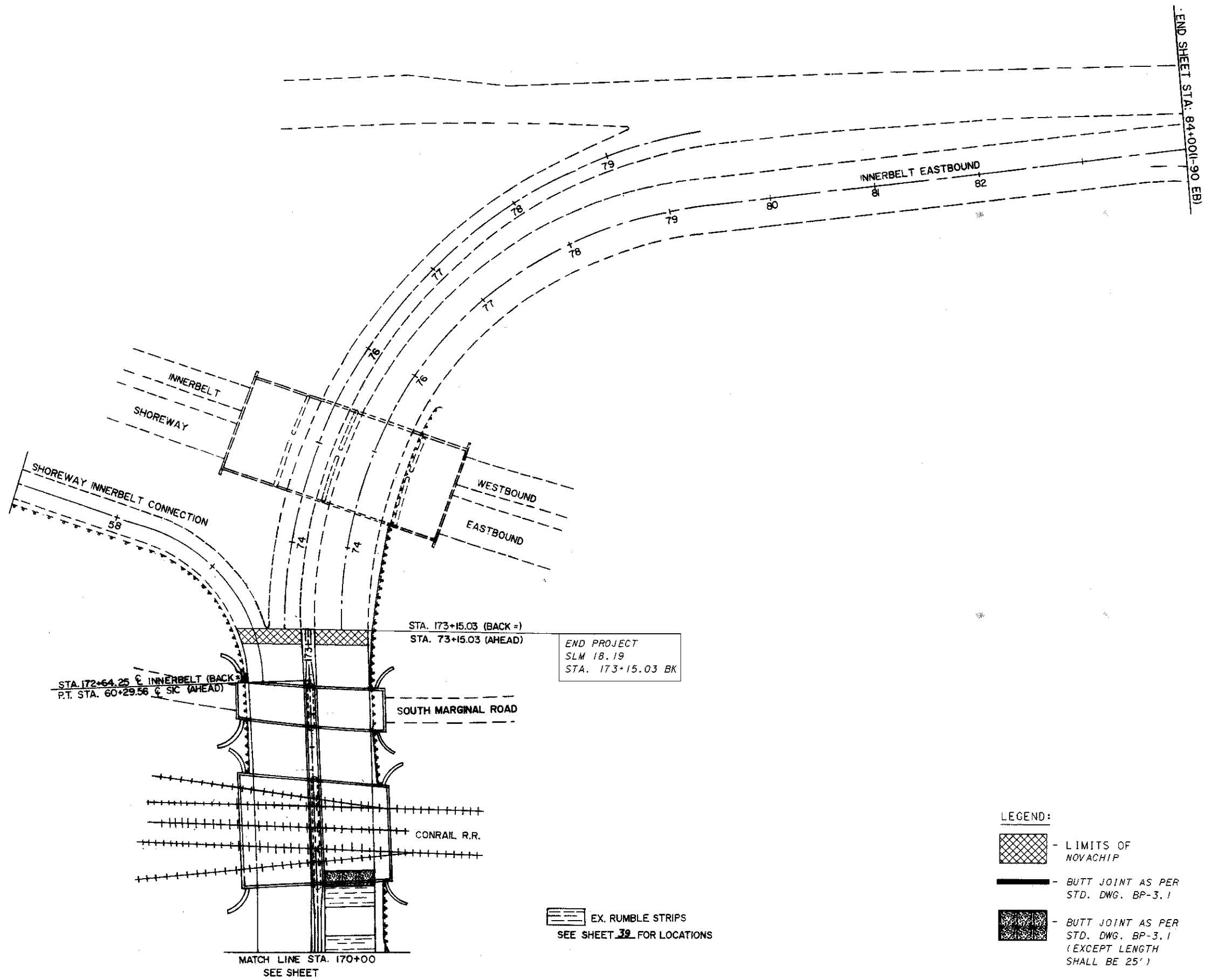


DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
		LGM




PLAN SHEET
IR-90 / INNERBELT FREEWAY
STA. 161+60 TO STA. 170+00

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

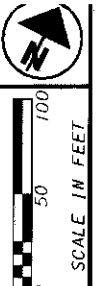
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LEGEND:

-  - LIMITS OF NOVACHIP
-  - BUTT JOINT AS PER STD. DWG. BP-3.1
-  - BUTT JOINT AS PER STD. DWG. BP-3.1 (EXCEPT LENGTH SHALL BE 25')

EX. RUMBLE STRIPS
SEE SHEET 39 FOR LOCATIONS



DRAWN	JRC
CHECKED	LGM
REVISIONS	

PLAN SHEET
 IR-90 / INNERBELT FREEWAY
 STA. 170+00 TO STA. 84+00

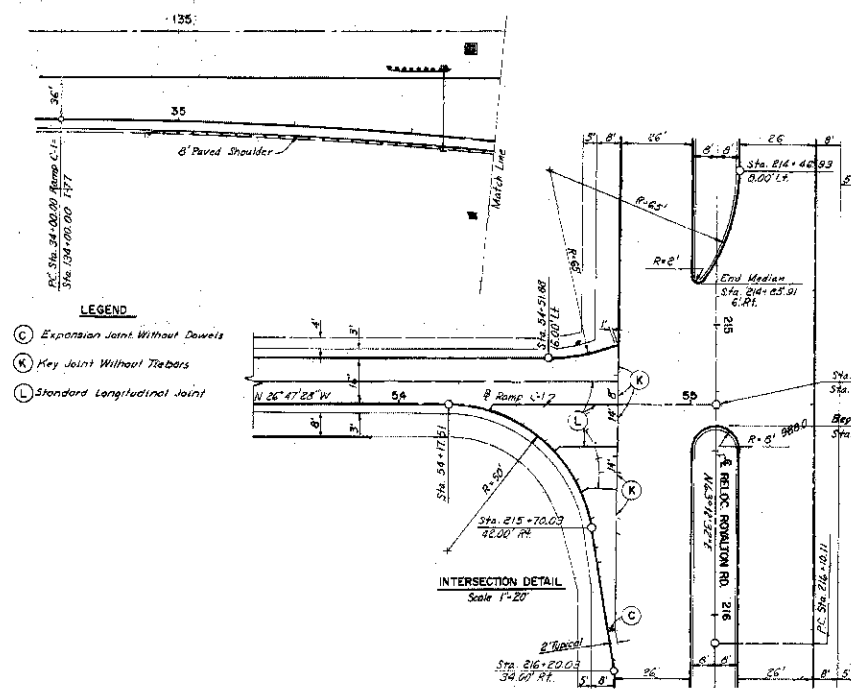
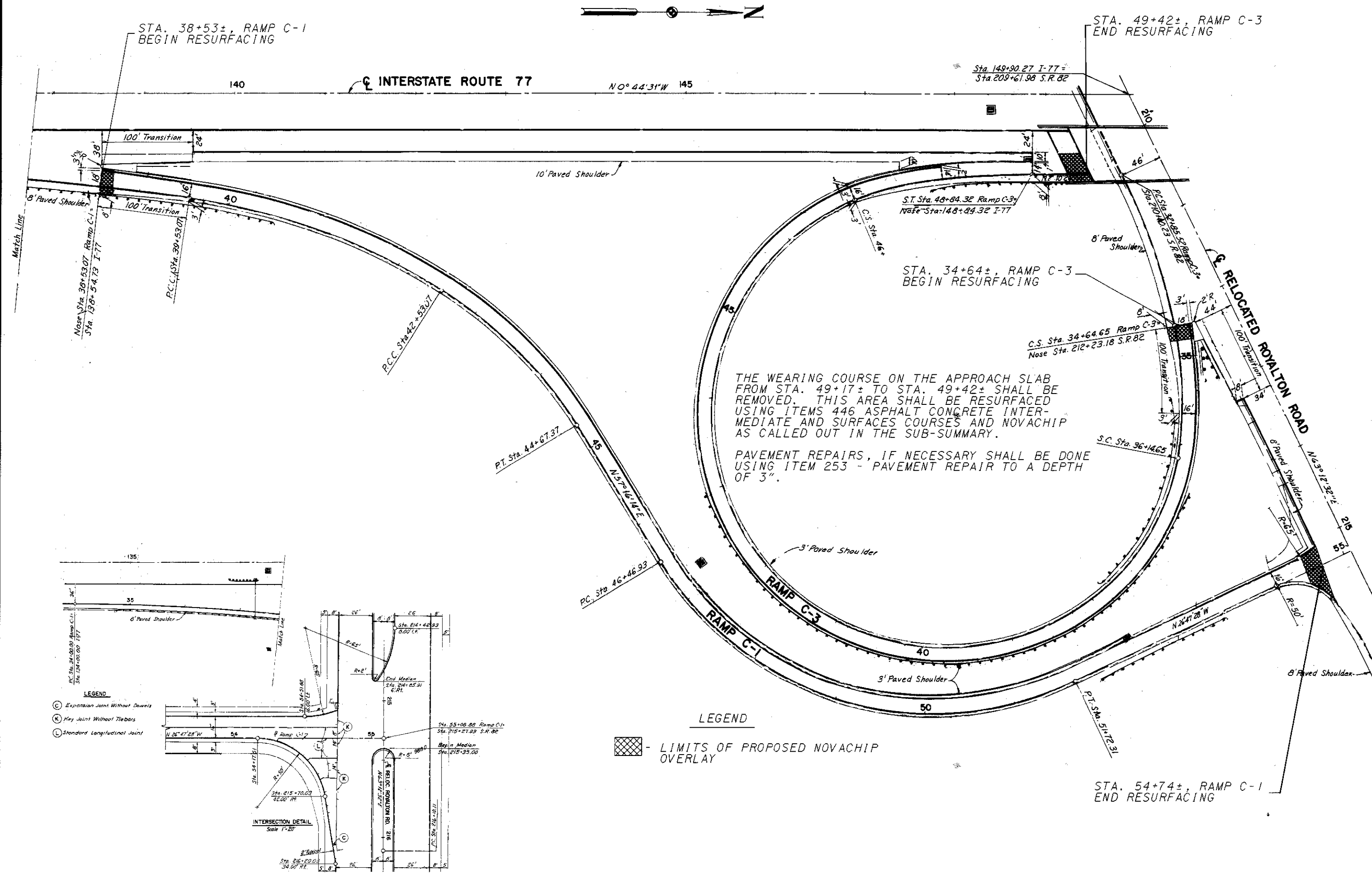
CUYAHOGA COUNTY
 CUY-90-16.22/VAR.



DRAWN	LGM	REVISED
CALCULATED	LGM	CHECKED
		JFC

PLAN SHEET
IR-77 / S.R. 82 RAMP C-1, C-3

CUYAHOGA COUNTY
CUY-90-16.22/VAR.



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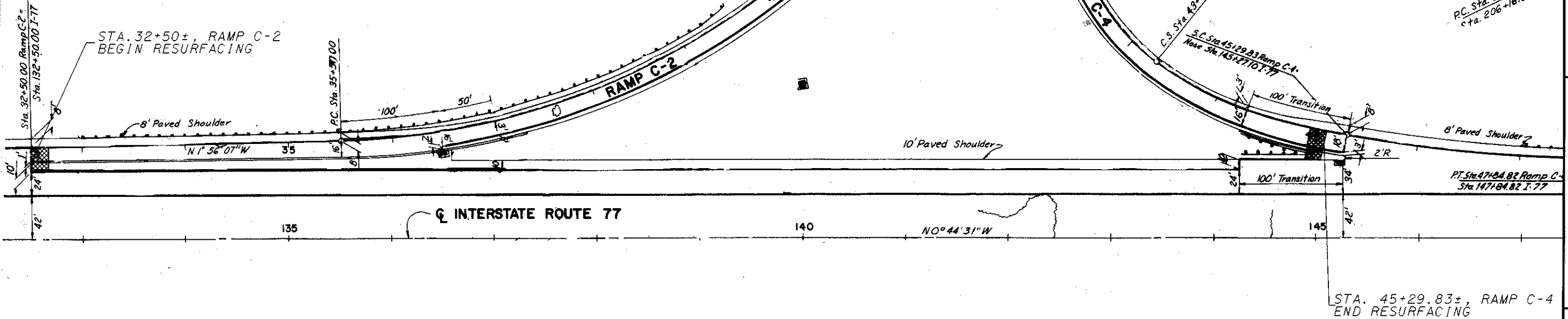
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- LEGEND**
- (C) Expansion Joint Without Dowels
 - (K) Key Joint Without Tiebars
 - (L) Standard Longitudinal Joint

INTERSECTION DETAIL
Scale: 1"=20'

LEGEND

▨ - LIMITS OF PROPOSED NOVACHIP OVERLAY



STA. 32+50±, RAMP C-2
BEGIN RESURFACING

8' Paved Shoulder

N 1° 36' 07" W

135

INTERSTATE ROUTE 77

140

N 0° 44' 31" W

145

STA. 45+29.83±, RAMP C-4
END RESURFACING

STA. 34+58.19±, RAMP C-4
BEGIN RESURFACING

100' Transition

100' Transition

8' Paved Shoulder

PT Sta. 47+64.82 Ramp C-4
Sta. 147+64.82 I-77

100' Transition

100' Transition

C.S. Sta. 34+68.79 Ramp C-4

Nose Sta. 34+58.19 Ramp C-4

Sta. 204+75.23 S.R. 82

PC Sta. 33+18.12 Ramp C-4

Sta. 206+16.08 S.R. 82

PC Sta. 44+09.30

PT Sta. 41+35.37

3' Paved Shoulder

N 48° 45' 54" W

3' Paved Shoulder

3' Paved Shoulder

RAMP C-4

3' Paved Shoulder

100' Transition

3' Paved Shoulder

100' Transition

3' Paved Shoulder

3' Paved Shoulder

3' Paved Shoulder

3' Paved Shoulder

3' Paved Shoulder

3' Paved Shoulder

3' Paved Shoulder

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3' Paved Shoulder

3' Paved Shoulder

3' Paved Shoulder

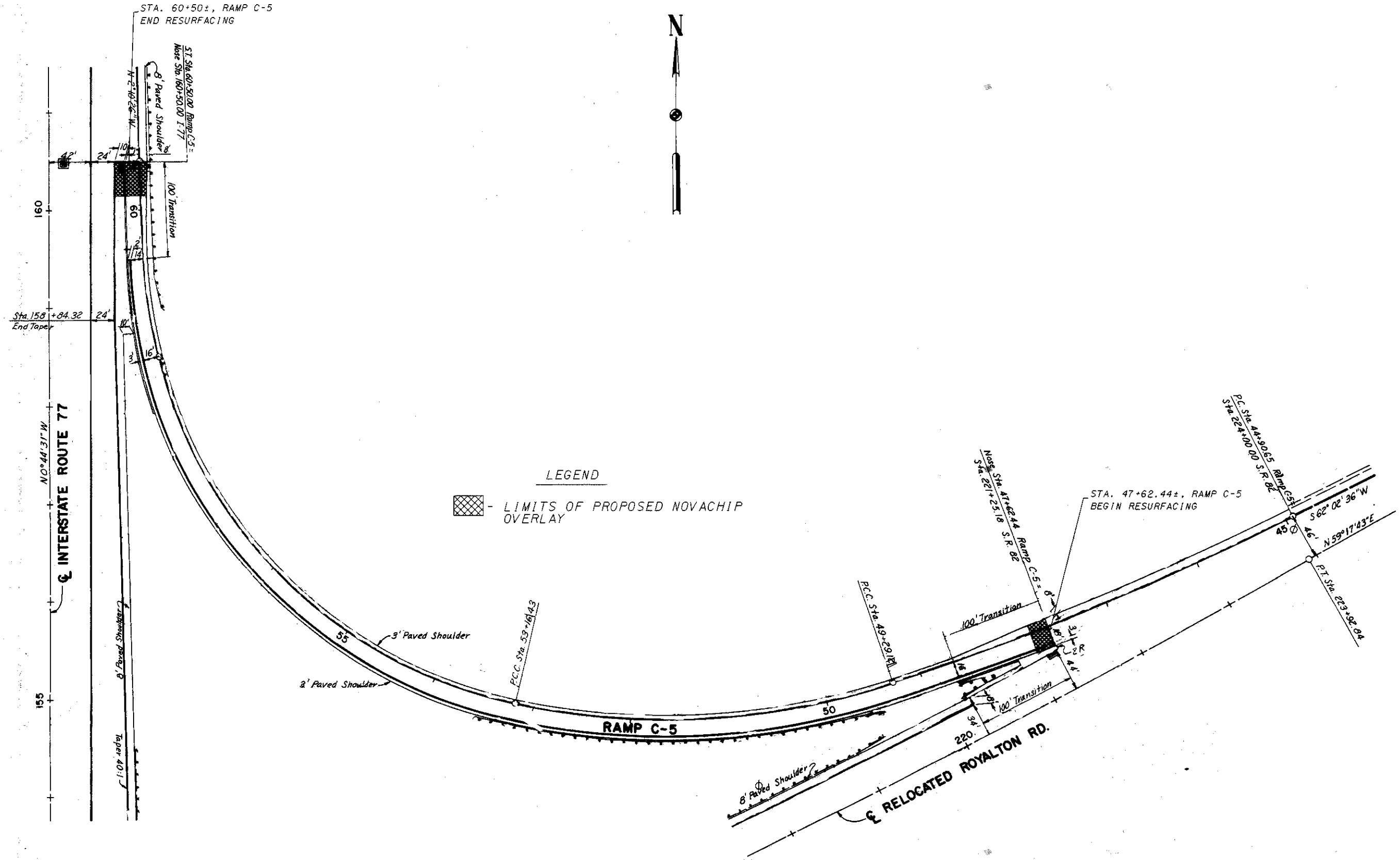
3' Paved Shoulder



DRAWN	LGM
CHECKED	JRC
CALCULATED	LGM
REVISED	JRC

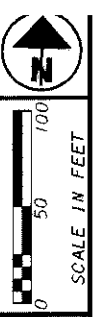
PLAN SHEET
IR-77 / S.R. 82 RAMPS C-2 AND C-4

CUYAHOGA COUNTY
CUY-90-16.22/VAR.



LEGEND

 - LIMITS OF PROPOSED NOVACHIP OVERLAY



DRAWN	LGM
CHECKED	JRC
CALCULATED	LGM
REVISED	

IR-77 / S.R. 82 RAMP C-5

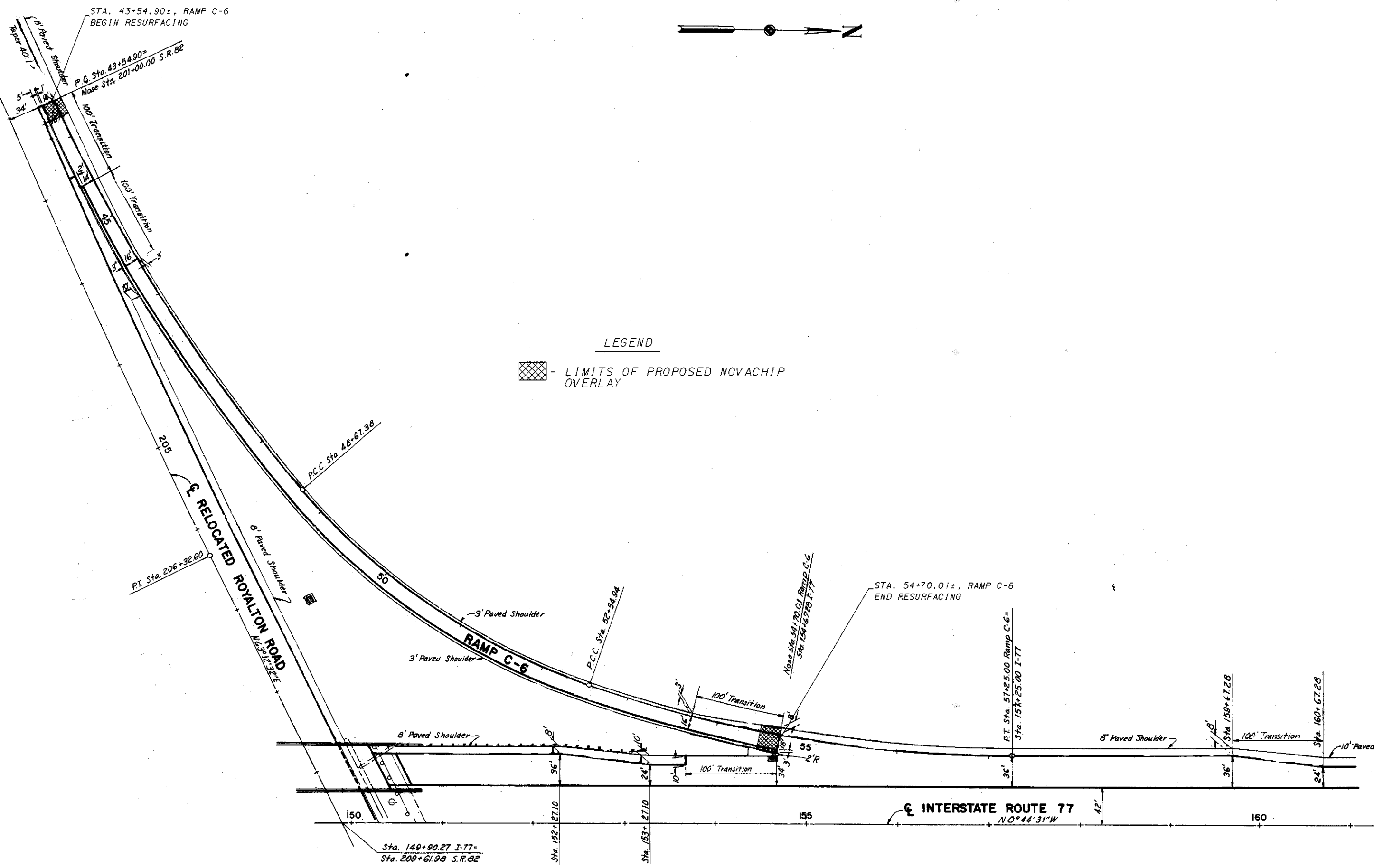
CUYAHOGA COUNTY
CUY-90-16.22/VAR.

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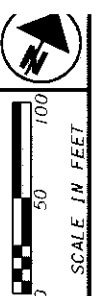
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LEGEND

▨ - LIMITS OF PROPOSED NOVACHIP OVERLAY

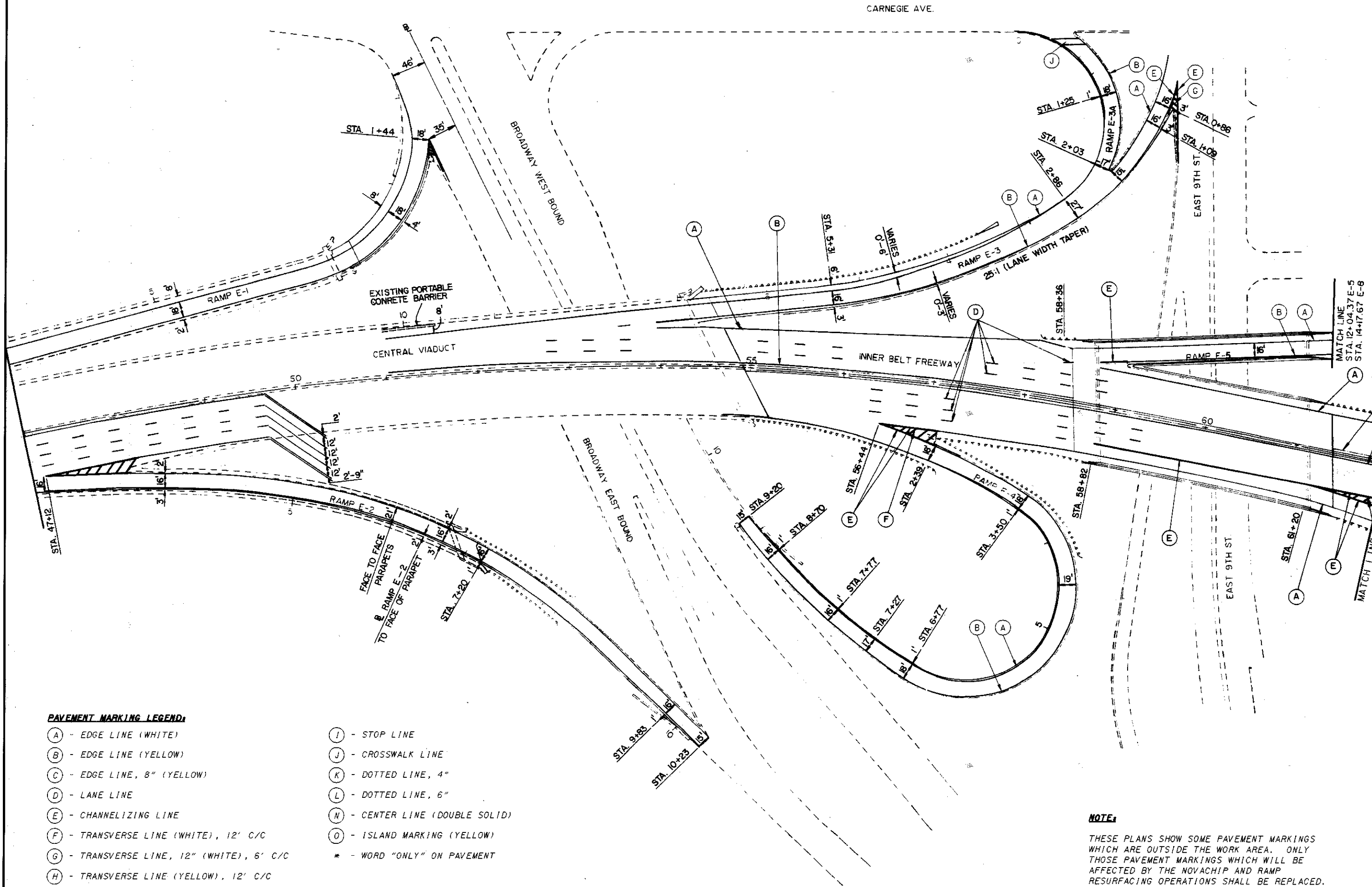


DRAWN	LGM
CHECKED	REVISED
CALCULATED	JRC

PLAN SHEET
IR-77 / S.R. 82 RAMP C-6

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

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PAVEMENT MARKING LEGEND:

- | | |
|--|----------------------------------|
| (A) - EDGE LINE (WHITE) | (I) - STOP LINE |
| (B) - EDGE LINE (YELLOW) | (J) - CROSSWALK LINE |
| (C) - EDGE LINE, 8" (YELLOW) | (K) - DOTTED LINE, 4" |
| (D) - LANE LINE | (L) - DOTTED LINE, 6" |
| (E) - CHANNELIZING LINE | (M) - CENTER LINE (DOUBLE SOLID) |
| (F) - TRANSVERSE LINE (WHITE), 12" C/C | (O) - ISLAND MARKING (YELLOW) |
| (G) - TRANSVERSE LINE, 12" (WHITE), 6" C/C | * - WORD "ONLY" ON PAVEMENT |
| (H) - TRANSVERSE LINE (YELLOW), 12" C/C | |

NOTE:

THESE PLANS SHOW SOME PAVEMENT MARKINGS WHICH ARE OUTSIDE THE WORK AREA. ONLY THOSE PAVEMENT MARKINGS WHICH WILL BE AFFECTED BY THE NOVACHIP AND RAMP RESURFACING OPERATIONS SHALL BE REPLACED.

SCALE IN FEET

DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
		LGM

CUYAHOGA COUNTY

IR-90 / INNERBELT FREEWAY

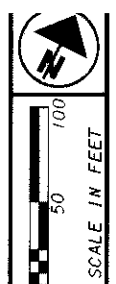
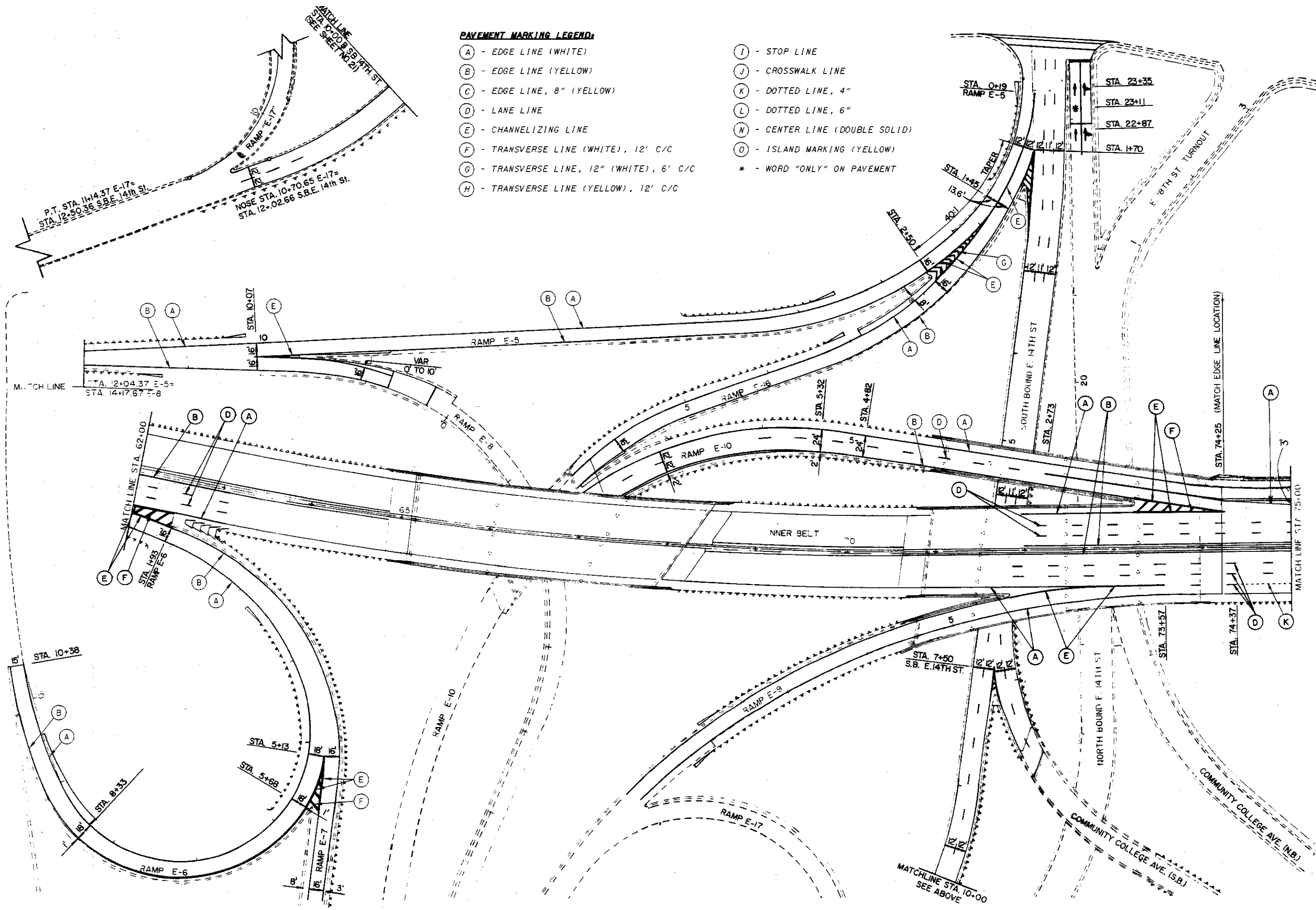
STA. 47+00 TO STA. 62+00

45
54

E. 9TH ST.

PAVEMENT MARKING LEGEND:

- (A) - EDGE LINE (WHITE)
- (B) - EDGE LINE (YELLOW)
- (C) - EDGE LINE, 8" (YELLOW)
- (D) - LANE LINE
- (E) - CHANNELIZING LINE
- (F) - TRANSVERSE LINE (WHITE), 12" C/C
- (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C
- (H) - TRANSVERSE LINE (YELLOW), 12" C/C
- (I) - STOP LINE
- (J) - CROSSWALK LINE
- (K) - DOTTED LINE, 4"
- (L) - DOTTED LINE, 6"
- (N) - CENTER LINE (DOUBLE SOLID)
- (O) - ISLAND MARKING (YELLOW)
- * - WORD "ONLY" ON PAVEMENT



DRAWN	JRC
CHECKED	LGM
CALCULATED	JRC
REVISIONS	

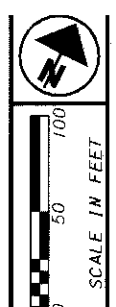
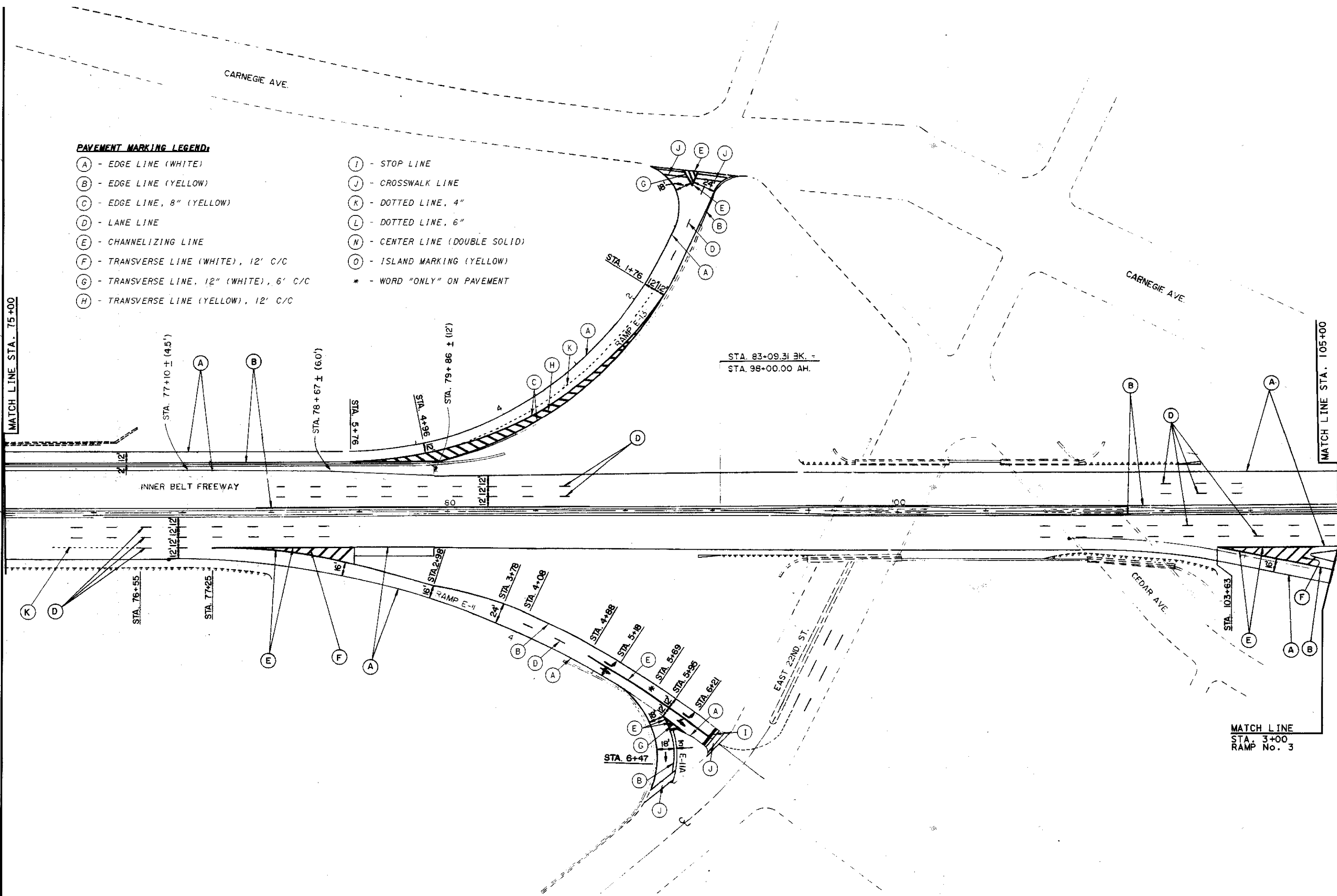
PAVEMENT MARKING PLAN SHEET
 I-90 / INNERBELT FREEWAY
 STA. 62+00 TO STA. 75+00

CUYAHOGA COUNTY
 CUY-90-16.22/AVR.

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PAVEMENT MARKING LEGEND:

- (A) - EDGE LINE (WHITE)
- (B) - EDGE LINE (YELLOW)
- (C) - EDGE LINE, 8" (YELLOW)
- (D) - LANE LINE
- (E) - CHANNELIZING LINE
- (F) - TRANSVERSE LINE (WHITE), 12' C/C
- (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C
- (H) - TRANSVERSE LINE (YELLOW), 12' C/C
- (I) - STOP LINE
- (J) - CROSSWALK LINE
- (K) - DOTTED LINE, 4"
- (L) - DOTTED LINE, 6"
- (N) - CENTER LINE (DOUBLE SOLID)
- (O) - ISLAND MARKING (YELLOW)
- * - WORD "ONLY" ON PAVEMENT



DRAWN	JRC	REVISER	
CALCULATED	JRC	CHECKED	LGM

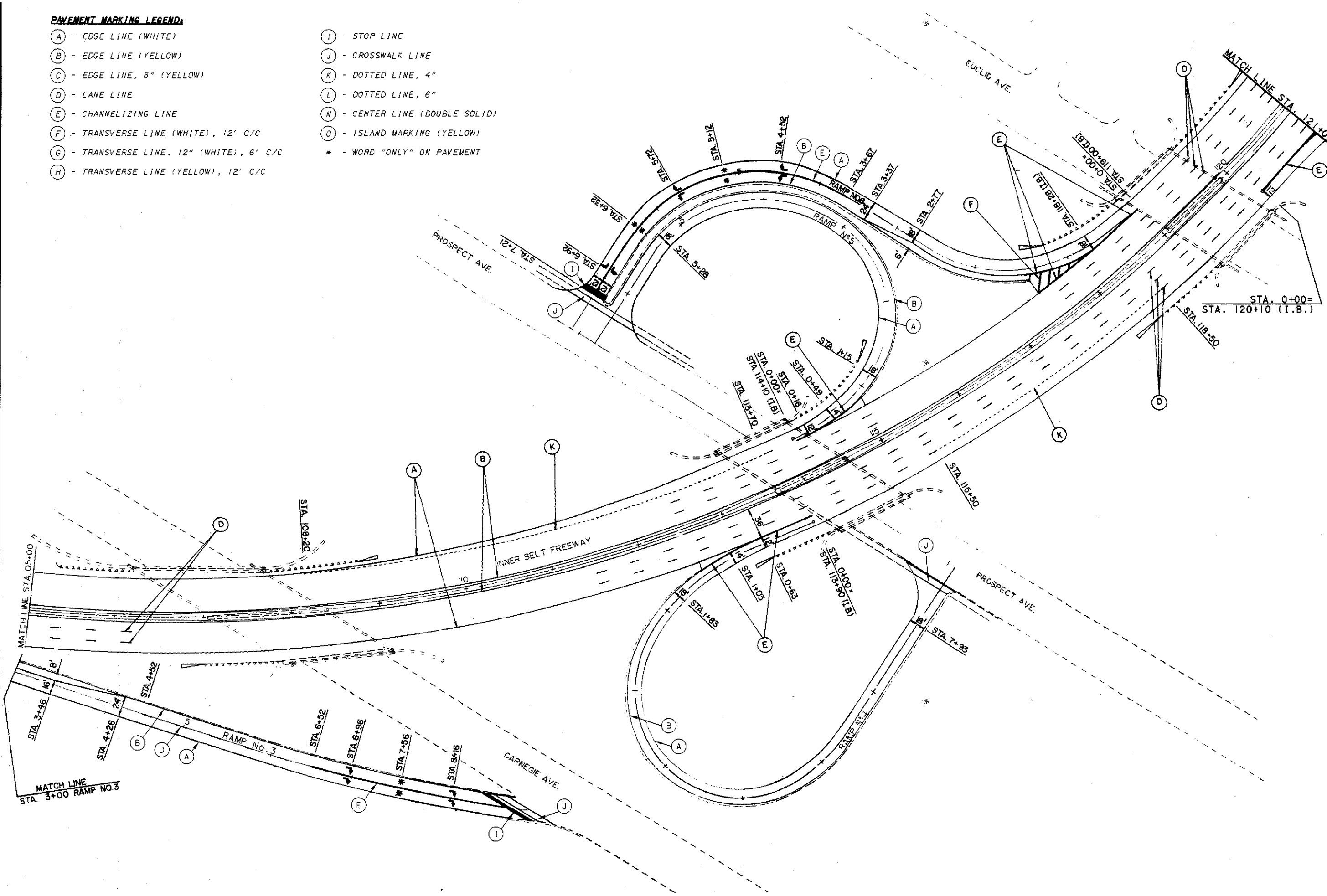
PAVEMENT MARKING PLAN SHEET
 I-90 / INNERBELT FREEWAY
 STA. 75+00 TO STA. 105+00

CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

PAVEMENT MARKING LEGEND:

- (A) - EDGE LINE (WHITE)
- (B) - EDGE LINE (YELLOW)
- (C) - EDGE LINE, 8" (YELLOW)
- (D) - LANE LINE
- (E) - CHANNELIZING LINE
- (F) - TRANSVERSE LINE (WHITE), 12' C/C
- (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C
- (H) - TRANSVERSE LINE (YELLOW), 12' C/C
- (I) - STOP LINE
- (J) - CROSSWALK LINE
- (K) - DOTTED LINE, 4"
- (L) - DOTTED LINE, 6"
- (N) - CENTER LINE (DOUBLE SOLID)
- (O) - ISLAND MARKING (YELLOW)
- * - WORD "ONLY" ON PAVEMENT

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CUYAHOGA COUNTY
CUY-90-16.22/VAR.

PAVEMENT MARKING PLAN SHEET
IR-90 / INNERBELT FREEWAY
STA. 105+00 TO STA. 121+00

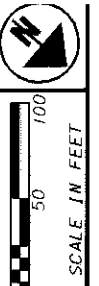
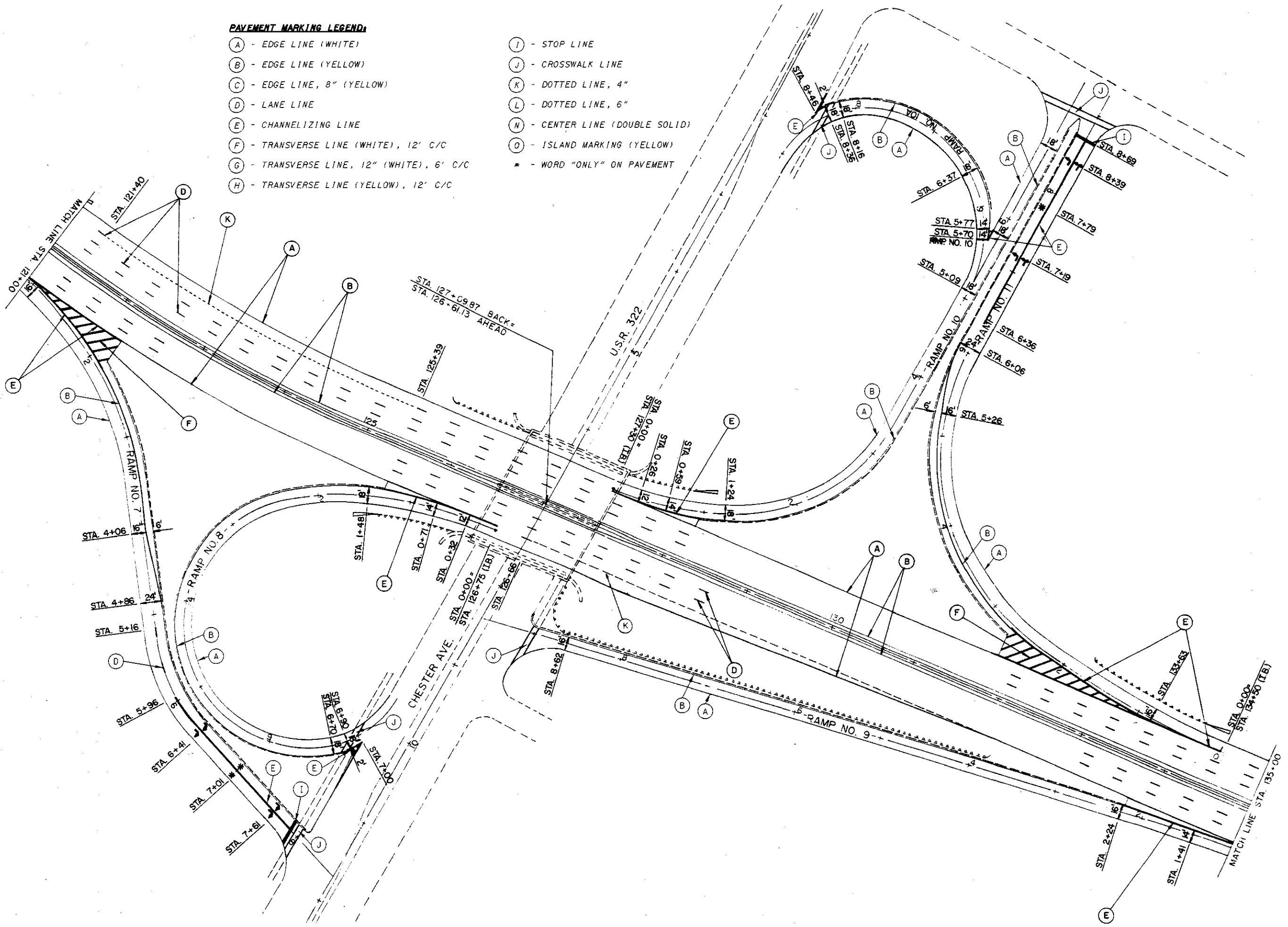
SCALE: 1" = 40'

48
54

DRAWN	JRC	REVISED	LGM
CALCULATED	JRC	CHECKED	LGM

PAVEMENT MARKING LEGEND:

- | | |
|--|----------------------------------|
| (A) - EDGE LINE (WHITE) | (I) - STOP LINE |
| (B) - EDGE LINE (YELLOW) | (J) - CROSSWALK LINE |
| (C) - EDGE LINE, 8" (YELLOW) | (K) - DOTTED LINE, 4" |
| (D) - LANE LINE | (L) - DOTTED LINE, 6" |
| (E) - CHANNELIZING LINE | (N) - CENTER LINE (DOUBLE SOLID) |
| (F) - TRANSVERSE LINE (WHITE), 12' C/C | (O) - ISLAND MARKING (YELLOW) |
| (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C | * - WORD "ONLY" ON PAVEMENT |
| (H) - TRANSVERSE LINE (YELLOW), 12' C/C | |



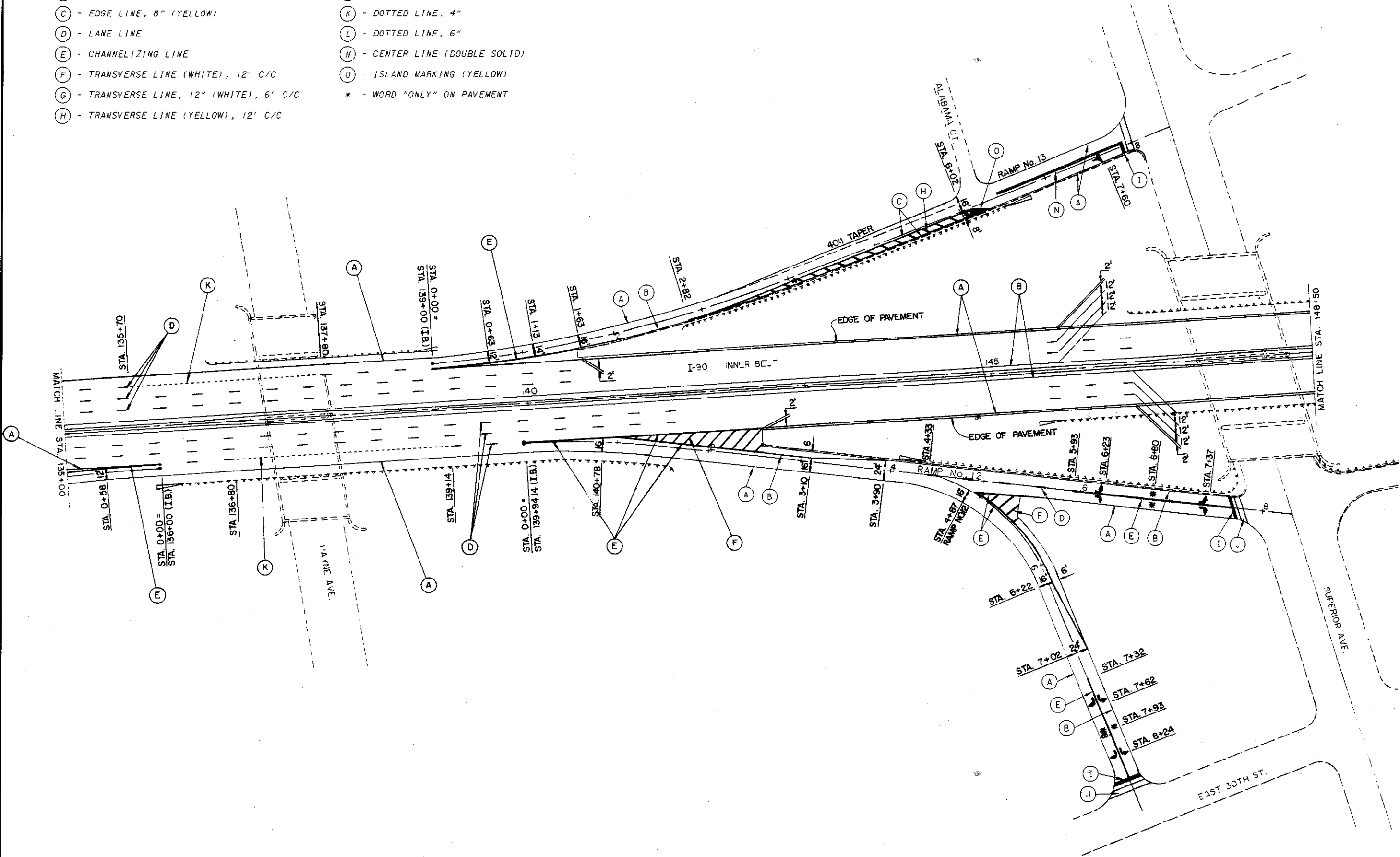
DRAWN	JRC	REVISED	
CHECKED	JRC		LGM

PAVEMENT MARKING PLAN SHEET
 I-90 / INNERBELT FREEWAY
 STA. 121+00 TO STA. 135+00

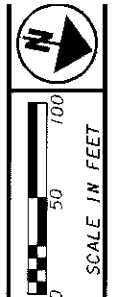
CUYAHOGA COUNTY
 CUY-90-16.22/VAR.

PAVEMENT MARKING LEGEND:

- (A) - EDGE LINE (WHITE)
- (B) - EDGE LINE (YELLOW)
- (C) - EDGE LINE, 8" (YELLOW)
- (D) - LANE LINE
- (E) - CHANNELIZING LINE
- (F) - TRANSVERSE LINE (WHITE), 12' C/C
- (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C
- (H) - TRANSVERSE LINE (YELLOW), 12' C/C
- (I) - STOP LINE
- (J) - CROSSWALK LINE
- (K) - DOTTED LINE, 4"
- (L) - DOTTED LINE, 6"
- (N) - CENTER LINE (DOUBLE SOLID)
- (O) - ISLAND MARKING (YELLOW)
- * - WORD "ONLY" ON PAVEMENT



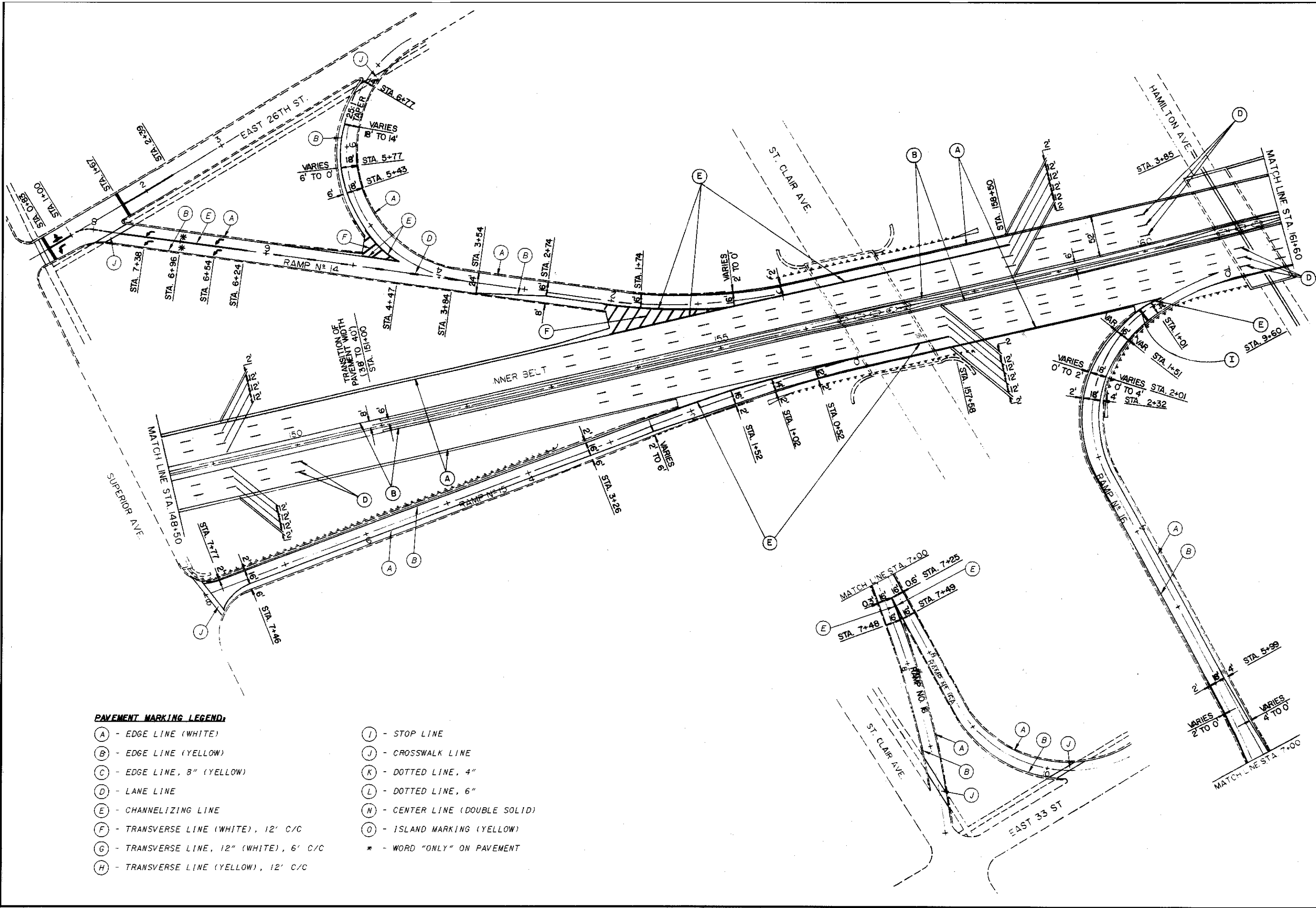
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DRAWN	JRC	REVISED	
CALCULATED	JRC	CHECKED	LGM

PAVEMENT MARKING PLAN SHEET
I-90 / INNERBELT FREEWAY
STA. 135+00 TO STA. 148+50

CUYAHOGA COUNTY
CUY-90-16.22/VAR.



PAVEMENT MARKING LEGEND:

- | | |
|--|----------------------------------|
| (A) - EDGE LINE (WHITE) | (I) - STOP LINE |
| (B) - EDGE LINE (YELLOW) | (J) - CROSSWALK LINE |
| (C) - EDGE LINE, 8" (YELLOW) | (K) - DOTTED LINE, 4" |
| (D) - LANE LINE | (L) - DOTTED LINE, 6" |
| (E) - CHANNELIZING LINE | (N) - CENTER LINE (DOUBLE SOLID) |
| (F) - TRANSVERSE LINE (WHITE), 12' C/C | (O) - ISLAND MARKING (YELLOW) |
| (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C | * - WORD "ONLY" ON PAVEMENT |
| (H) - TRANSVERSE LINE (YELLOW), 12' C/C | |

SCALE: 1/4" = 1' FEET

DRAWN	JRC
REVIS	REVISED

CALCULATED	JRC
CHECKED	LGM

PAVEMENT MARKING PLAN SHEET

JR-90 / INNERBELT FREEWAY

STA. 148+50 TO STA. 161+60

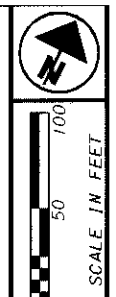
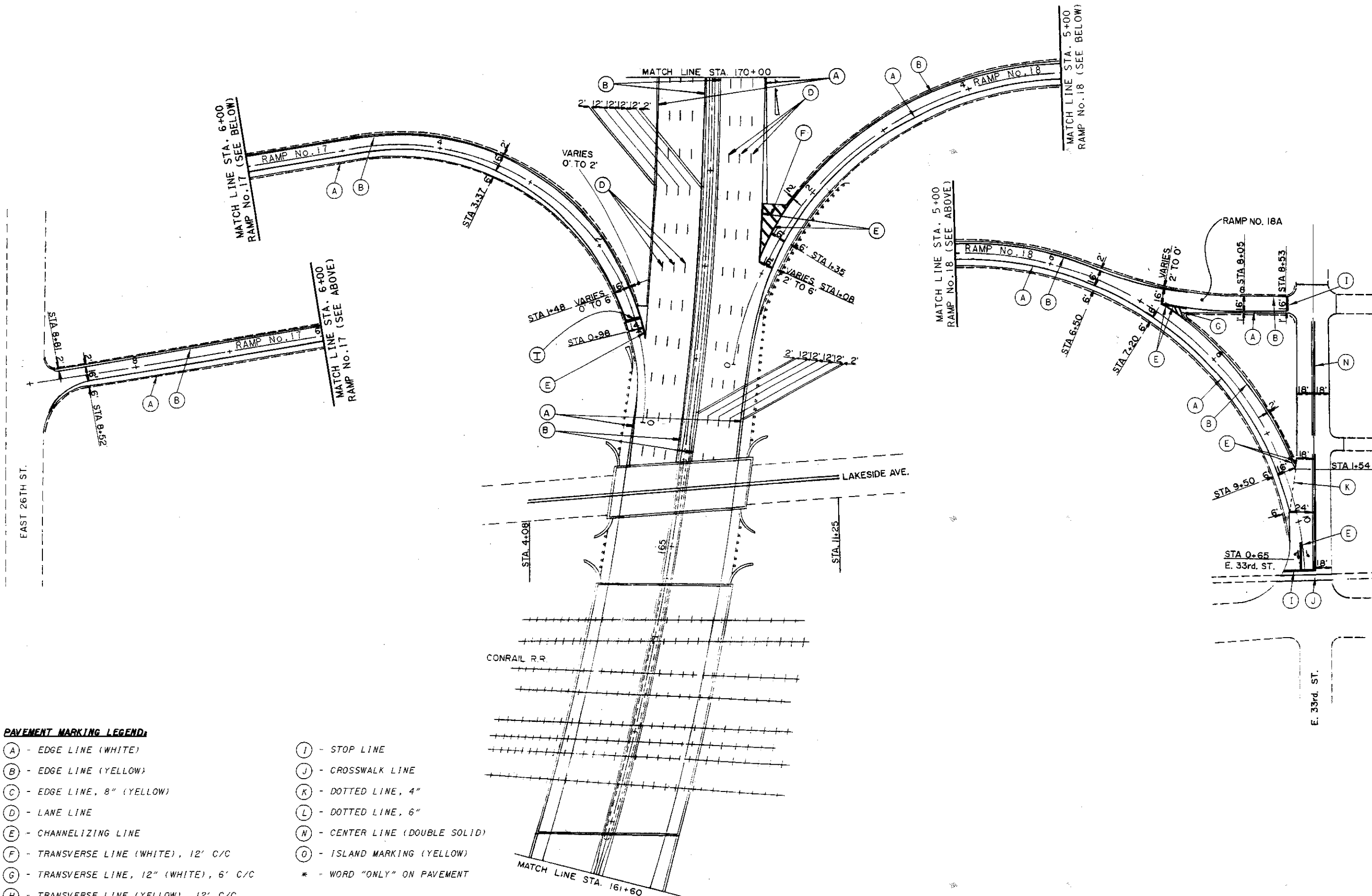
CUYAHOGA COUNTY

CUY-90-16.22/VAR.

51
54

PAVEMENT MARKING LEGEND:

- | | |
|--|----------------------------------|
| (A) - EDGE LINE (WHITE) | (I) - STOP LINE |
| (B) - EDGE LINE (YELLOW) | (J) - CROSSWALK LINE |
| (C) - EDGE LINE, 8" (YELLOW) | (K) - DOTTED LINE, 4" |
| (D) - LANE LINE | (L) - DOTTED LINE, 6" |
| (E) - CHANNELIZING LINE | (N) - CENTER LINE (DOUBLE SOLID) |
| (F) - TRANSVERSE LINE (WHITE), 12' C/C | (O) - ISLAND MARKING (YELLOW) |
| (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C | * - WORD "ONLY" ON PAVEMENT |
| (H) - TRANSVERSE LINE (YELLOW), 12' C/C | |

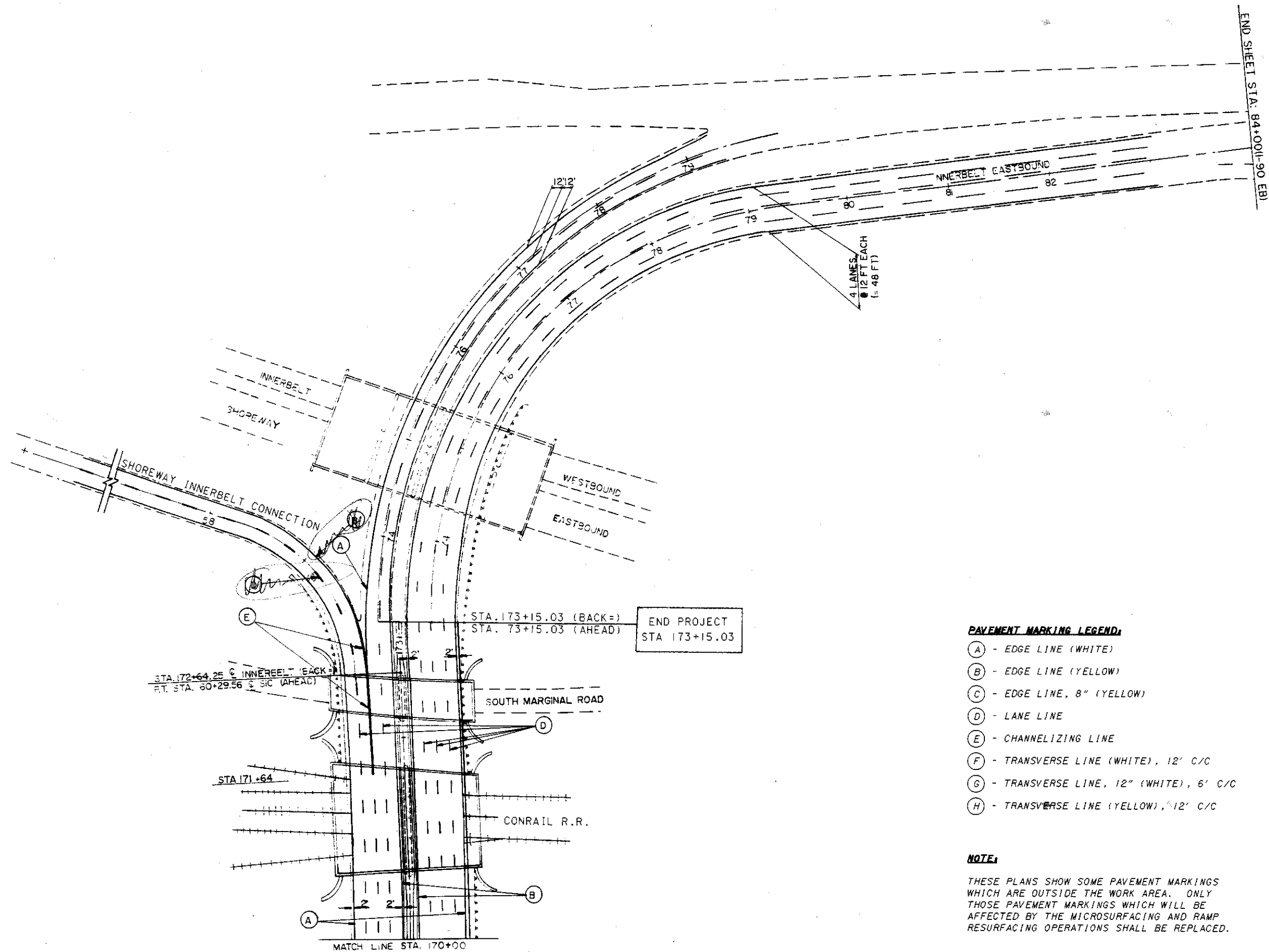


DRAWN	JRC	REVISED	
CALCULATED	JRC	CHECKED	LGM

PAVEMENT MARKING PLAN SHEET
JR-90 / INNERBELT FREEWAY
STA. 161+60 TO STA. 170+00

CUYAHOGA COUNTY
CUY-90-16.22/VAR.

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PAVEMENT MARKING LEGEND:

- | | |
|--|----------------------------------|
| (A) - EDGE LINE (WHITE) | (I) - STOP LINE |
| (B) - EDGE LINE (YELLOW) | (J) - CROSSWALK LINE |
| (C) - EDGE LINE, 8" (YELLOW) | (K) - DOTTED LINE, 4" |
| (D) - LANE LINE | (L) - DOTTED LINE, 6" |
| (E) - CHANNELIZING LINE | (M) - CENTER LINE (DOUBLE SOLID) |
| (F) - TRANSVERSE LINE (WHITE), 12' C/C | (O) - ISLAND MARKING (YELLOW) |
| (G) - TRANSVERSE LINE, 12" (WHITE), 6' C/C | * - WORD "ONLY" ON PAVEMENT |
| (H) - TRANSVERSE LINE (YELLOW), 12' C/C | |

NOTE:

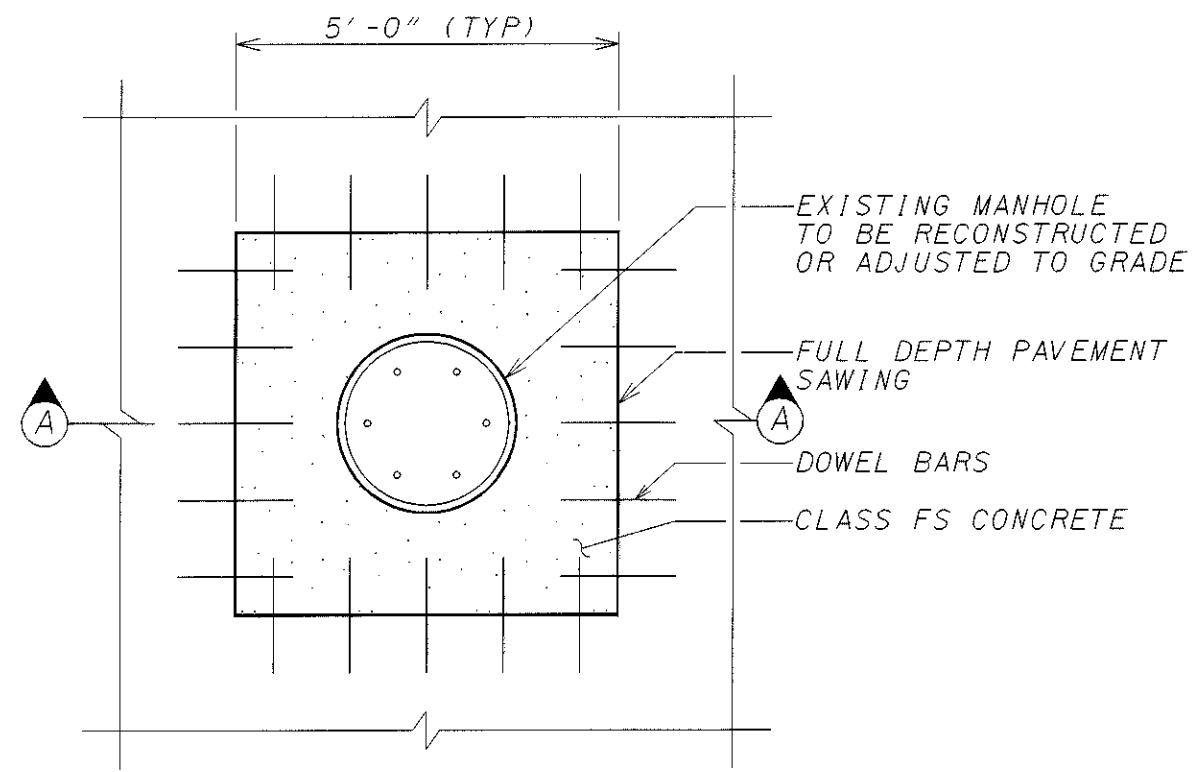
THESE PLANS SHOW SOME PAVEMENT MARKINGS WHICH ARE OUTSIDE THE WORK AREA. ONLY THOSE PAVEMENT MARKINGS WHICH WILL BE AFFECTED BY THE MICROSURFACING AND RAMP RESURFACING OPERATIONS SHALL BE REPLACED.



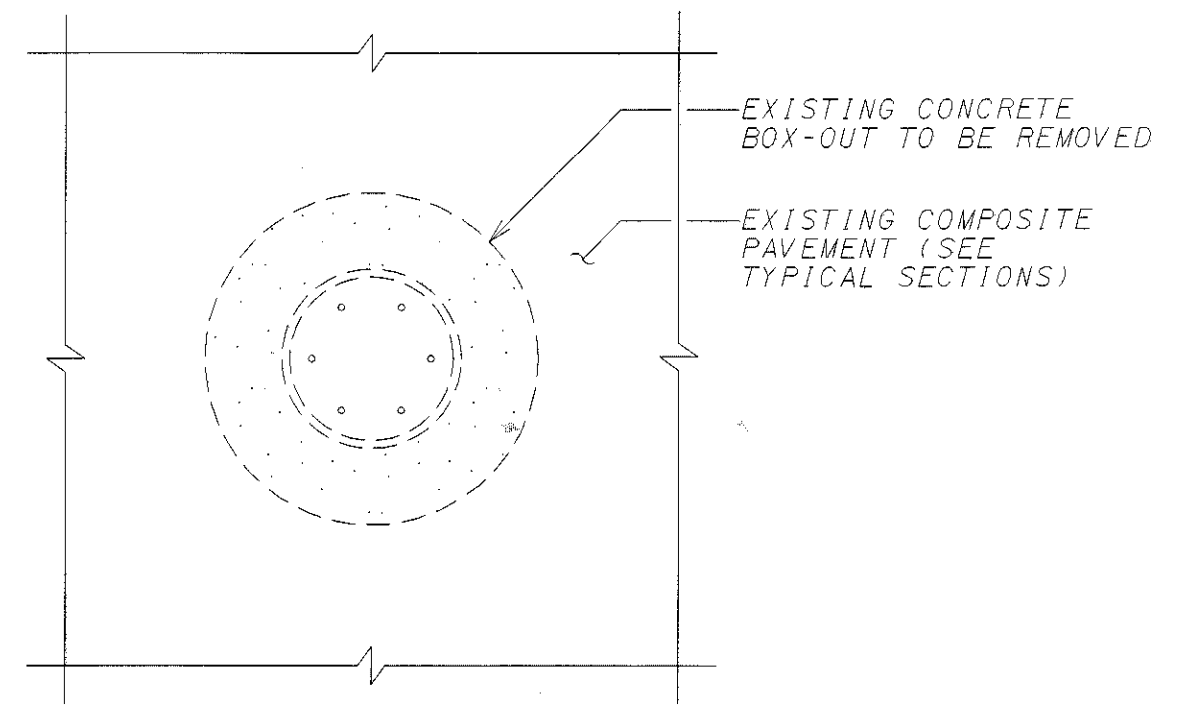
DRAWN	JRC	REVISED
CALCULATED	JRC	CHECKED
		LGM

PAVEMENT MARKING PLAN SHEET
IR-90 / INNERBELT FREEWAY
STA. 170+00 TO STA. 84+00

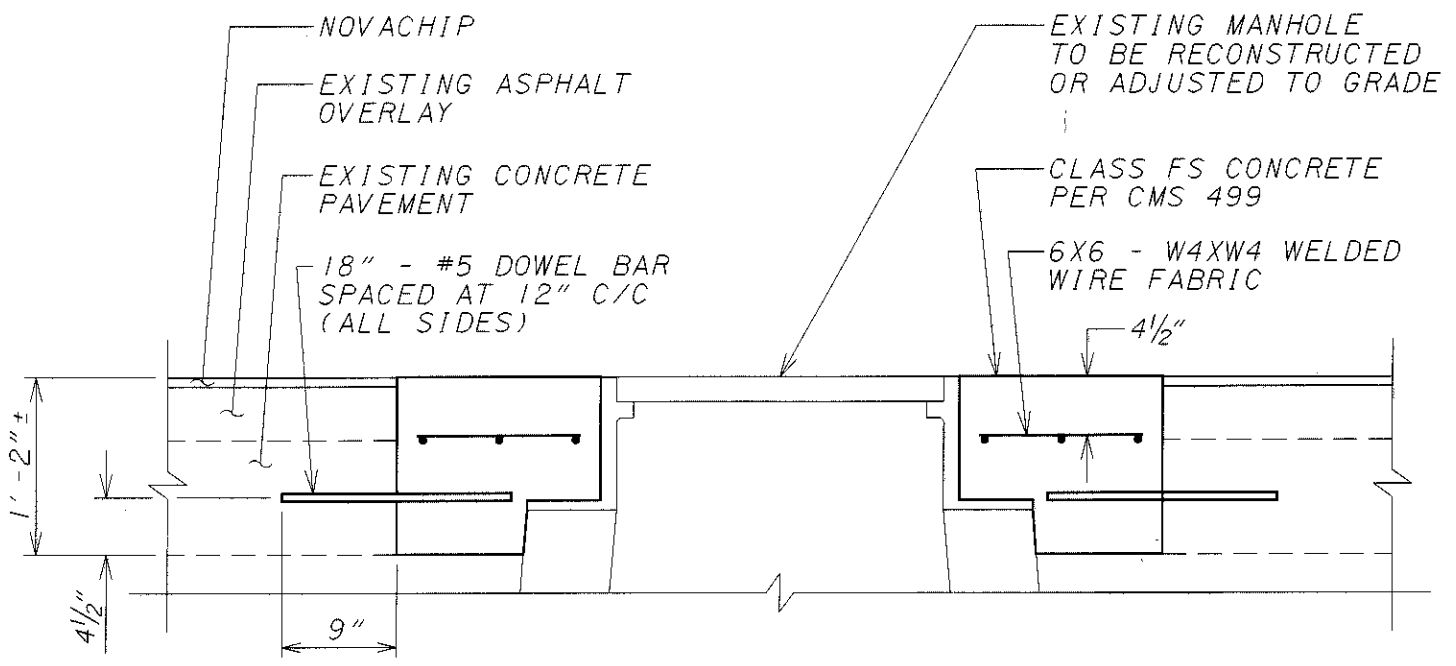
CUYAHOGA COUNTY
CUY-90-16.22/VAR.



PROPOSED CONCRETE BOX-OUT
WELD WIRE FABRIC NOT SHOWN FOR CLARITY



EXISTING CONCRETE BOX-OUT



SECTION A-A

NOTES:

- 1) WELDED WIRE FABRIC SHALL COMFORM TO CMS 709.10
- 2) DOWEL BARS SHALL COMFORM TO CMS 709.13 AND BE INSTALL PER CMS 255.05 USING NON-SHRINK NON-METALLIC EPOXY GROUT
- 3) ALL EQUIPMENT, MATERIALS, AND LABOR REQUIRED TO REPLACE THE EXISTING BOX-OUTS, AS SHOWN ON THIS SHEET, SHALL BE INCLUDED FOR PAYMENT UNDER EITHER ITEM 604-MANHOLE ADJUSTED TO GRADE, AS PER PLAN OR ITEM 604-MANHOLE RECONSTRUCTED TO GRADE, AS PER PLAN, WHICHEVER ITEM IS MORE APPROPRIATE BASED ON CASTING CONDITION.
- 4) SEE GENERAL NOTES FOR ITEM 604-MANHOLE ADJUSTED TO GRADE, AS PER PLAN AND ITEM 604-MANHOLE RECONSTRUCTED TO GRADE, AS PER PLAN.

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**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 806**

**FIELD OFFICE
September 9, 1997**

806.01 Description

806.02 General

806.03 Computer Equipment for Field Office

806.04 Basis of Payment

806.01 Description. This item shall consist of providing, maintaining and subsequently removing a field office for the exclusive use of the Department for the duration of the contract at a location approved by the Engineer. The field office will be designated as Type A, B or C.

806.02 General. The field office shall be available and completely functional at a time directed by the Engineer. The office shall have a minimum ceiling height of 2.1 m (7 feet) and have provisions for maintaining room temperature between 20 and 27 C (68 and 80 F). The Type C field office shall have a separate enclosed room for the Engineer. The Contractor shall provide and maintain telephone and electric service. One phone shall be connected to a recorded answering device. One speaker phone shall be required for Type B or Type C facilities. All field office types shall have one copying machine ;the copier shall be provided with all necessary maintenance and paper supplies, and be capable of producing multiple copies of documents up to 216 by 356 mm (8 1/2 by 14-inch) in size. The Type B and Type C field offices shall have a facsimile machine.

The office shall be provided with potable hot and cold water. The office shall also have neat, sanitary, enclosed toilet accommodations; associated lavatory and sanitary supplies shall be furnished. Portable facilities may be provided with the approval of the Engineer.

On all projects requiring moisture and density control of construction materials, the field office shall contain a storage box for a nuclear density gauge in accordance with drawings on file with the Director.

Additional requirements for field office and office equipment are as specified in the following table:

FIELD OFFICE

Item	Type A	Type B	Type C
Floor Space, m ² (sq. ft.).....	14 (150)	46 (500)	93 (1000)
Telephone	2	4	4
Base Radio & 4-Hand Held Units ¹	--	--	1
10 Column Electronic Calculator with Tape	1	2	3
Desk and Chair Set	1	3	5
Work Tables, 750 by 1800 mm (30 by 72-inch)	1	2	3
4 Drawer, Legal Size, Lockable Metal File Cabinet	--	1	2
2 Drawer, Metal File Cabinet ...	1	2	2
Portable Fire Extinguishers - Type 2A10BC-5#	1	1	2
All Weather Parking Spaces ...	4	8	10
Plan Rack ²	1	1	2

1. Units shall be capable of transmitting and receiving voice communication between office and any area on the project site.

2. Capable of handling the breakdown of 559x864 mm (22x34 inch) sized plans in to 10 sections.

The preceding requirements for the field office may be modified only upon written approval of the Engineer.

806.03 Computer Equipment for Field Office. Where required, the Contractor shall furnish, install, and maintain the following computer hardware and software in the field office required by this item for the life of the contract. All computer hardware and software furnished shall be for the exclusive use of the Engineer and staff and shall be operable at the same time as the field office.

This system shall not experience down time exceeding 48 hours from notification by the Engineer. The Contractor shall replace stolen, vandalized, or units otherwise inoperable within 48 hours after notification by the Engineer. Upon completion of the contract, the hardware and software furnished by the Contractor shall remain the property of the Contractor.

Computer Hardware

- (1) One IBM PC compatible computer with an Intel Pentium processor (or equal) operating at a minimum 200 MHz. The computer shall be provided with the following **minimum** requirements:
 - a. 2.1 Gigabyte hard disk
 - b. 32 Megabytes RAM

- c. one 3.5 inch., 1.44 MB floppy drive
- d. one 8x CD-ROM drive
- e. 101 key keyboard
- f. 15 inch Hi-Res Super VGA Color Monitor 1024 X 768 resolution with .28 dot pitch and Hi-Res Super VGA Card with 2 Megabytes of Video RAM.
- g. 2 Button Microsoft compatible mouse with appropriate software, compatible with required software.
- h. At least 1 parallel port and 1 serial interface port and 1 mouse port.
- i. one 56K firmware upgradeable 3Com compatible modem

(2) Hewlett Packard LaserJet compatible (PCL3 emulation) 6 page per minute printer or approved equal and parallel printer cable.

(3) Surge Protector. 15 amp six outlet with circuit breaker control, phone line circuit surge protection and a surge indicator light.

Computer Software

The Contractor shall furnish, load, and maintain the following software on the computers provided in the field offices: Microsoft Windows 95 (with games removed) and the Corel Professional Edition Office Suite Version 8.

All computer hardware and software shall be maintained by the Contractor during the life of the contract. Information for proposed "equal" equipment shall be submitted to the Engineer and be approved prior to use.

Along with the furniture under 806.02, the Contractor shall also provide the necessary stands, tables, etc. to accommodate the computer system.

806.04 Basis of Payment. The field office will be paid for at the contract price bid, which price shall be full compensation for furnishing, maintaining and subsequently removing the field office and all incidentals necessary to complete this item. The field office and any required computer equipment shall be paid on a monthly basis. The contract bid price shall be full compensation for furnishing, setting up, maintaining, and subsequently removing the specified computer hardware and software from the field office.

Item	Unit	Description
806	Month	Field office, Type _____
806	Month	Computer equipment for field office

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 828
EPOXY PAVEMENT MARKING

July 28, 1998

828.01 Description

828.02 Epoxy Pavement Marking Material

828.03 Glass Beads

828.04 Equipment

828.05 Cleaning and Surface Preparation

828.06 Application

828.07 Method of Measurement

828.08 Final Acceptance

828.09 Basis of Payment

828.01 Description. This work shall consist of furnishing and applying epoxy pavement markings in accordance with 641, 740 and the additional requirements described herein.

The epoxy material and installation shall be in compliance with all the applicable EPA and local environmental regulations.

In general, the marking material shall consist of four components: Part A (White or Yellow), Part B, Size I Glass Beads, and Size II Glass Beads, as described below.

828.02 Epoxy Pavement Marking Material. Epoxy pavement markings shall be prequalified in accordance with Supplement 1047. Material supplied shall be a two-part epoxy system capable of being applied at ambient temperature down to 10°C (50°F). The material shall be capable of retaining reflective glass beads of the drop-on type or spray-on type.

Epoxy shall comply with the following requirements:

a. **Formulation:** The epoxy shall be formulated as a Long Life Pavement Marking System, capable of providing a minimum of 4 years of performance, free of any peroxides, and/or TMPTA (Trimethylolpropane triacrylate) and other such multi-functional monomers. The epoxy should be designed to provide simple volumetric mixing ratio of its components (such as 2:1).

b. **Viscosity:** The viscosity of the various parts shall be as follows:

Part A White	19,000 - 20,000 cP
Part A Yellow	25,000 - 26,000 cP
Part B	1,950 - 2,050 cP

At the point of application the viscosity shall be within 10 percent of each other.

c. **Weight:** The weight of each part shall be as follows:

Part A White	1.41 kg/L ±.02 kg/L (11.8 ±.0.2 pounds/gallon)
Part A Yellow	1.53 kg/L ±.02 kg/L (12.8 ±.0.2 pounds/gallon)
Part B	1.15 kg/L ± .02 kg/L (9.6 ±.0.2 pounds/gallon).

d. **Epoxide Number:** The epoxide number of the epoxy resin shall be 0.51 ± 0.05 as determined by ASTM D 1652 for both white and yellow Part A on a pigment free basis.

e. **Amine Number:** The amine number of the curing agent (Part B) shall be 375 ± 50 as per ASTM D 2074 on a pigment free basis.

f. **Toxicity:** Upon heating to application temperature, the material shall not exude fumes which are toxic or injurious to persons or property. After curing the materials should be completely inert with all components fully reacted and environmentally safe.

g. **Drying Time (Laboratory):** The pavement marking material, when mixed in the proper ratio and applied at the properly prescribed wet film thickness at $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$) and with the proper saturation of glass beads, shall exhibit a no tracking time of 40-45 minutes when tested according to ASTM D 711.

h. **Drying Time (field):** The pavement marking material shall have a setting time to a no-tracking condition of not more than 35 minutes. The line must be protected from tracking during the setting period by coning off or as specified in the plans.

i. **Curing:** The epoxy pavement marking material shall be capable of fully curing at a constant surface temperature of 7°C (45°F) or above.

j. **Adhesion to Pavement (Portland Cement Concrete and Asphalt):** The cured pavement marking materials, when tested according to ACI Method 503, shall have such a high degree of adhesion to the specified Portland cement concrete [compressive strength, 27,000 kPa (4,000 PSI) minimum] or asphalt surface such that there shall be a 100 percent substrate failure in the performance of this test. The prepared specimens shall be conditioned at room temperature $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for a minimum of 24 hours and a maximum of 72 hours prior to the performance of the indicated test.

k. **Hardness:** The epoxy pavement marking materials, when tested according to ASTM D 224, shall have a Shore D Hardness of between 70 and 90. Samples shall be allowed to cure at room temperature $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for a minimum of 24 hours and a maximum of 72 hours prior to performing the indicated test.

l. **Tensile Strength:** When tested in accordance with ASTM D 638, the epoxy pavement marking materials shall have a tensile strength of not less than 34,000 kPa (5,000 psi). The Type IV specimens shall be cast in a suitable mold and pulled at a rate of 6 mm (1/4 inch) per minute, by a

suitable dynamic testing machine. The samples shall be allowed to cure at room temperature $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for a minimum of 24 hours and a maximum of 72 hours prior to performing the indicated test.

m. Compressive Resistance: When tested according to ASTM D 695, a catalyzed epoxy pavement marking materials shall have a compressive strength of not less than 83,000 kPa (12,000 psi). The cast sample shall be conditioned at room temperature $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for a minimum of 72 hours before performing the indicated test. The rate of compression for these samples shall be no more than 6 mm (1/4 inch) per minute.

n. Abrasion Resistance: The abrasion resistance shall be evaluated on a Taber Abrader with a 1.0 kg (2.2 pounds) load and CS-17 wheels. The duration of the test shall be 1,000 cycles. The wear index shall be calculated based on ASTM C 501 and the wear index for a catalyzed material shall not be more than 100 mg (0.02 pounds). The test shall be run on cured samples of materials which have been applied at a film thickness of 0.5 mm (20 mil) to code S-16 stainless steel plates. The samples shall be allowed to cure at $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for a minimum of 24 hours and a maximum of 72 hours prior to performing the indicated test.

o. Impact Strength:

(1) Sample preparation: Properly mixed material shall be applied on a minimum of 28 days old clean concrete and shall be allowed to cure for 72 hours at $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$). Film thickness of the material shall be at the appropriately prescribed thickness.

(2) Testing: At a temperature of $24^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$), a 0.9 kg (2 pound) round steel ball shall be dropped from a height of 1,200 mm (48 inches) on the cured sample. No cracking or chipping of the material shall take place.

p. Color: The mixed epoxy compound, both white and yellow, shall be applied to 2 sets of 76 mm x 152 mm (3 inches x 6 inches) aluminum panels at 0.5 mm (20 ± 1 mil) in thickness, one set with no glass beads and one set with glass beads (must ensure 50/50 distribution of Size I and Size II beads for this will impact the results of the test). Expose the prepared samples in a Q.U.V. Environmental Testing Chamber, as described in ASTM G 53, and they shall conform to the following requirements in alternating cycles:

The test shall be conducted for 75 hours at 50°C (122°F), 4 hours humidity and 4 hours U.V., in alternating cycles. The prepared panels shall be cured at 25°C (77°F) for 72 hours prior to exposure.

The color of the white epoxy material shall not be darker than the Federal Standard No. 595A-17855. The color of the yellow epoxy polymer material shall be same as Federal Standard No. 595A-13415.

q. Certificate of compliance: The material manufacturer shall furnish a notarized certification that the material complies with the provisions of this specification. It shall not be inferred that the provisions of a certification of compliance waives state inspection, sampling, or testing.

r. Laboratory samples: Promptly after execution of the contract, the Contractor shall notify the Engineer of the sources of material he expects to use. The material manufacturer shall furnish samples of the epoxy materials as may be required by the Engineer, a minimum of ten days before the date of intended use of these materials.

s. Infrared spectra: A copy of the infrared spectra of each component on each lot number shall be supplied by the manufacturer along with the certification papers. This infrared spectra will be on record with the Department to serve as a quality control measure for the future supply of this system to the State.

t. Manufacturer Qualifications : The manufacturer must have expertise and performance history including: Must have completed and passed the service test in accordance with Supplement 1047; verifiable installations; ample production capacity; proper facility; compliance with EPA regulations ; verifiable quality control program; in Ohio must have passed a minimum of 4 years of performance (durability and retroreflectivity) on concrete or asphalt surface.

u. Qualifying contractor: The Contractor shall demonstrate an ability to satisfactorily apply the material in the presence of the Engineer at a mutually agreed upon location, before commencement of the work. A previous statement of demonstrated ability to apply this material issued by any ODOT district will suffice as evidence of qualification.

828.03 Glass Beads. In addition to the requirements of 740.10, the following shall apply:

Glass bead packaging shall clearly indicate EPOXY - SIZE I or EPOXY SIZE II.

Inspection shall be done at the project site. Random samples shall be obtained from material delivered to the project site, or at other locations designated by the Laboratory.

The glass beads shall have the following gradation when tested in accordance with ASTM D 1214.

SIZE I Sieve Size	Percent Retained	SIZE II Sieve Size	Percent Retained
2.00 mm (No. 10)	0	850 µm (No. 20)	0-5
1.70 mm (No. 12)	0-5	600 µm (No. 30)	5-20
1.40 mm (No. 14)	5-20	300 µm (No. 50)	30-75
1.18 mm (No. 16)	40-80	180 µm (No. 80)	9-32
1.00 mm (No. 18)	10-40	150 µm (No. 100)	0-5
850 µm (No. 20)	0-5	pan	0-2
pan	0-2		

Reflective Media: The glass beads shall be smooth, clear, free from any air inclusions and scratches that might affect their functions as a retro-reflective media, and shall have the characteristics listed below.

Roundness (Percent by Weight): Not more than 20 percent of the glass beads shall be irregular or fused spheroids, and at least 80 percent of the beads shall be true beads.

Index of Refraction: The refractive index of the beads shall be a minimum of 1.50 as determined by the liquid immersion method at 25° C (77° F). The silica content of glass beads shall not be less than 60%.

Coating: The glass beads, Size I, shall be coated with a silane-type adherence coating to enhance its embedment in, and adherence to the applied binder film. The coated beads shall emit a yellow-green fluorescence when tested by the Dansyl Chloride test procedure. The Size II glass beads shall be treated with a moisture-proof coating. Both types of glass beads shall show no tendency to absorb moisture in storage and shall remain free of clusters and lumps. They shall flow freely from dispensing equipment at any time when surface and atmosphere conditions are satisfactory for marking operations.

The moisture-resistance of the glass beads shall be determined on the basis of the following test:

Place 1 kg (2.2 pounds) of beads in a washed cotton bag, having a thread count of 8 per square centimeter (50 per square inch) (warp and woof) and immerse the bag in a container of water for 30 seconds. Remove the bag and force the excess water from the sample by squeezing the bag. Suspend and allow to drain for two hours at room temperature (21°-22°C) (70°-72°F). After draining mix the sample in the bag by shaking thoroughly. Transfer a sample slowly to a clean, dry glass funnel having a stem 100 mm (4 inches) in length, with a 10 mm (3/8 inches) inside diameter stem entrance opening and a minimum exit opening of 6 mm (1/4 inches). The entire sample shall flow freely through the funnel without stoppage. When first introduced to the funnel, if the beads clog, it is permissible to tap the funnel to initiate flow.

828.04 Equipment. Equipment for applying the epoxy pavement marking shall be capable of mixing the components in proportions recommended by the manufacturer and applying glass beads at the time of the line placement. The equipment used shall be capable of applying epoxy material at the specified thickness, width and pattern. The Contractor shall provide a calibrated measuring device acceptable to the Engineer to measure the epoxy resin in the striper tanks.

The application equipment shall be a mobile, truck mounted and self contained pavement marking machine, specifically designed to spray the epoxy binder and reflective glass beads in continuous and skip line patterns. The application equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of legends, symbols, crosswalks, and other special patterns.

The Engineer and the Material Manufacturer together may approve the use of a portable applicator in lieu of truck mounted accessories for use in applying special marking only, provided such equipment can demonstrate satisfactory application of reflectorized markings in accordance with these specifications.

The mobile applicator shall include the following features:

1. Individual material reservoirs, or space, for the storage of Part A and Part B of the epoxy binder.
2. Heating equipment of sufficient capacity to maintain the individual binder components at the manufacturer's recommended temperature and produce the required amount of heat at the mixing head & gun tip and maintain those temperatures with the tolerances recommended by the binder manufacturer for the spray application.
3. Adequate individual tanks for the storage and dispensing of Size I and Size II glass beads.
4. Individual dispensers for the simultaneous application of Size I and Size II glass beads respectively. Each dispenser shall be capable of applying beads at a rate up to 2.4 kg per liter (20 pounds per gallon).

5. Individual metering devices on the proportioning pumps (one indicator per pump) as well as stroke counters to monitor liter usage. All such devices shall be clearly visible.

6. All the necessary spray equipment mixers, compressors and other appurtenances to allow for the placement of reflectorized pavement marking systems in a simultaneous sequence of operations.

7. A minimum 600 mm (24 inches) long static mixer unit or an equivalent system that produces properly mixed material.

8. A completely enclosed flush and purge system to clean the lines and the guns without expelling any of the solution into the environment.

828.05 Cleaning and Surface Preparation. The contractor shall clean the surface to remove all debris, laitance oil and any other contaminants that may hinder the adhesion of the system to the surface. Whenever grinding, scarifying, sandblasting, shot blasting or other operations are performed, the debris generated shall be contained through vacuum type equipment or equivalent and the work shall be conducted in such a manner that the finished pavement surface is not damaged or unnecessarily scarred or left in a pattern that will mislead or misdirect the motorist. When these operations are completed, the pavement surface shall first be power broomed and then blown off with compressed air to remove residue and debris resulting from the cleaning work. All such debris shall be contained, and disposed of in the appropriate manner.

Cleaning and surface preparation work shall be conducted in such a manner as to control and minimize airborne dust, and similar debris.

Any new asphalt concrete pavement containing SBS, SBR latex, or SMA latex polymer modifiers shall be lightly abraded to the manufacturer's specifications to remove the polymer surface film to assure proper bonding. In no case shall the removal of the polymer surface film be less than that required for the epoxy to properly bond and adhere. On all other new asphalt pavements, no surface preparation is required.

For any other type of modified asphalt or for open graded friction course asphalts, the Contractor shall contact the manufacturer for surface preparation recommendations.

In all cases the manufacturer's recommendations for surface preparation shall be followed.

The cost of the light abrading, sandblasting or any surface preparation shall be included in the unit bid cost for each line or pavement marking.

Care shall be taken when performing the surface preparation and cleaning work to prevent damage to transverse and longitudinal joint sealers.

Limits of work: Surface preparation shall be confined to the surface area specified for the application

of pavement marking materials on the plans or as directed by the Engineer.

Surface preparation work includes cleaning for lines or cleaning for letters and symbols. Lines will be meant to include: Solid lines; Broken lines; Dotted lines; Channelizing lines; Stop lines and Crosswalk lines.

The area of preparation will be the width of the new pavement marking, or existing line, plus 25 mm (1 inch) on each side and the length of broken lines plus 300 mm (12 inches) on each end. When letters and symbols are cleaned the area of preparation will be sufficiently large to accommodate the new marking, or to remove the existing marking. No new markings, lines, crossbars or symbols shall be applied on any pavement that has not been properly prepared as per this specification.

On new Portland cement concrete pavements, cleaning operations shall not begin until a minimum of 30 days after the placement of concrete. The extent of the cleaning work shall be to prepare the concrete surface such that: (a) There is no visible evidence of curing compound on the concrete surface. (b) There are no heavy puddled deposits of curing compound in the valleys of the textured concrete surface. (c) All remaining curing compound is intact; all loose and flaking material is removed. (d) The peaks of the textured pavement surface are rounded in profile and free of sharp edges and irregularities. (e) The extent of the cleaning should be as such to insure the laitance is removed on both old as well as new concrete.

In the event that epoxy pavement marking is to be placed over existing pavement markings, the existing pavement marking shall be removed.

Pavement markings shall be removed to the extent that 95 to 100 percent of the existing marking is removed. Removal operations shall be conducted in such a manner that no more than moderate color and/or surface texture change results on the surrounding pavement surface.

828.06 Application. Epoxy marking material shall be applied only when the surface is clean and dry and when the pavement and air temperature are above 10°C (50°F). The Contractor shall transfer the entire contents of each material container to the striper tanks. The material shall be thoroughly mixed at all times during application.

Epoxy marking material shall be applied uniformly to the surface to be marked at the following rate in liters per kilometer (gallons per mile) of line. To achieve this rate the thickness of binder must be 20 mils ± 1 mil.

Liters per kilometer of line	Width of line (mm)				
	100	150	200	300	600
Solid line	52	78	103	155	310
Dashed line	13	20	26	40	80
Dotted line	17	26	35	52	103
Symbols, words	0.5 l/sq. meter				

Gallons per mile of line

	Width of line (Inches)				
	4	6	8	12	24
Solid Line	22	33	44	66	132
Dashed line	5.5	8.3	11	17	33
Dotted Line	7.3	11	14.7	22	44
Symbols, Words	1.0 Gallon per 80 Square feet				

On open graded asphalts the above rate shall be increased by 25 percent to achieve the required thickness of 25 mils \pm 1 mil.

Thinning is not permitted.

Glass beads shall be applied to the uncured epoxy material in sufficient quantity so that the beads completely fill the epoxy film from the film-pavement interface to the top surface of the film to the extent that there are loose beads on the surface of the uncured line. The rate of application shall not be less than 3 kg (25 pounds) of glass beads per liter (gallon) of epoxy material applied. Glass beads shall be dropped on in a double-drop system with the large gradation (Size I) first and the regular gradation (Size II) second in the same pass of the equipment. The beads shall be applied in equal amount by weight.

If the epoxy marking does not dry to a no-tracking condition consistently and shows a cyclical soft spot, the Contractor shall cease marking application until the problem is corrected.

828.07 Method of Measurement. In addition to the requirements of 641.12, the following shall apply:

1. The Contractor must submit certified documents from the manufacturer listing of the amount of epoxy (in liters) and glass beads (in kilograms) shipped for the particular project.
2. In the field the Contractor shall furnish a calibrated device to measure the quantity of materials used such as stroke counters mounted on the dispensing pumps. Stroke counter readings must be taken at the beginning and end of each day by the Engineer. Caution must be taken while re-circulating the material to turn off the stroke counter on the pump. Using the "dipping the tank" method is not sufficient.
3. The rate of application of materials shall be verified by comparing the amount of materials used with the computed amount needed for each section. Where short sections are involved and it is not practical or feasible to determine the quantities used on each and every short section, such sections may, by agreement between the Engineer and Contractor, be grouped together to verify the quantities used.
4. Removal of pavement markings must be indicated on the plans, and will be paid for in the units indicated in 828.09.

828.08 Final Acceptance: Pavement markings which are unacceptable, or become unacceptable prior to final acceptance, as determined by the Engineer, for causes such as, but not limited to, improper application, loss of adhesion to the pavement, non-uniform retroreflectivity, or non-retroreflectivity, shall be replaced by the Contractor with markings conforming to these specifications and requirements at his expense without delay, or the Contractor may request that the work be considered non-performed. The Contractor will receive no payment for unacceptable work which is considered non-performed.

828.09 Basis of Payment. Payment for accepted quantities complete in place will be made at the contract prices, or prices adjusted in accordance with 641.11 for:

Item	Unit	Description
828	Kilometer (mile)	Edge line
828	Kilometer (mile)	Lane line
828	Kilometer (mile)	Center line
828	Meter (linear foot)	Channelizing line
828	Meter (linear foot)	Stop line
828	Meter (linear foot)	Crosswalk line
828	Meter (linear foot)	Transverse line
828	Meter (linear foot)	Curb marking
828	Square meter (square foot)	Island marking
828	Each	Handicap symbol marking
828	Each	Railroad symbol marking
828	Each	School symbol marking, ___mm (in.)
828	Meter (linear foot)	Parking lot stall marking
828	Each	Lane arrow
828	Each	Word on pavement, ___mm (in.)
828	Meter (linear foot)	Dotted line
828	Each, meter(linear foot), square meter (square foot)	Removal of pavement marking
828	Lump sum	Two-way radio equipment

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION 905
OPEN HEARTH AND BASIC OXYGEN FURNACE STEEL SLAG AGGREGATE
USED FOR ITEMS 203, 304, 306, 307, 410, 411, 617, 503 OR 603**

April 1, 1998

Open Hearth (OH) or Basic Oxygen Furnace (BOF) slag shall not be used for Aggregate or Soil for Item 603 Bedding or Backfill, for Items 306 Cement Treated Free Draining Base or 307 Non-Stabilized Drainage Base, Item 503.10 Backfill; or under, around or within 15 meters (50 feet) of any structure.

OH and BOF slag may be used in Item 203 Embankment, as defined in 203.02, if the OH or BOF slag is blended in a 3:1 mixture (3 parts natural soil and 1 part OH or BOF slag). The 3:1 mixture shall be placed at least 0.3m (1.0 ft) below the flow line of the underdrains or other drainage items susceptible to runoff as per 203.08. Aging and stock piling requirements of this specification are required.

OH and BOF slag may be used for surface course applications in Items 617, 410 and 411, if the OH and BOF slag meets the above specifications, and meets the aging and stock piling, deleterious substances, and crushing requirements of this specification.

BOF slag shall not be allowed for non-surface course applications in Items 304, 410, 411 or 617.

Recycled OH or BOF slag from Department or non-Department projects may be used in Item 203, or surface course applications in Items 617, 410 or 411, if the material meets the requirements of this specification.

OH slag may be used for Item 304 and for a non-surface course application in Items 617, 410 and 411, if the OH slag meets the above specifications and all the additions and deletions listed below;

Recycled OH or BOF slag from Department or non-Department projects shall not be allowed.

Deleterious substances (soft pieces) shall include soft lime, lime oxide or magnesia agglomerations or any foreign materials prone to rapid disintegration under construction processing and weathering conditions.

Deleterious substances (soft pieces) in accordance with Supplement 1029 (hand crushing of soft pieces) shall be less than 3 percent by weight.

Material passing the 75 μ m(200 sieve) shall be less than 10 percent by weight.

No crushing of OH or BOF slag shall be allowed.

Identification of OH Slag. Clear, definitive and undisputable identification of the OH slag is required for OH slag used for Item 304 or for a non-surface course application in Items 617, 410 or 411.

The producer shall show the Department evidence that the material supplied is open hearth slag. This information shall consist of but not be limited to the following:

Steel producer, production dates, production rates, stockpiling dates, type of steel produced, and all known Department and non-Department projects where the material was previously used.

This identification of OH slag may be supplemented by other information approved by the Department or by using 10 years of good performance data. The producer shall submit to the Department projects where the OH slag has been used without expansion or tufa problems. The Department will review the above projects as part of the identification approval process.

All OH slag not identified as open hearth slag shall be considered basic oxygen furnace slag unless identified otherwise.

Tufa Performance Verified. Tufa is a precipitate form of calcium carbonate that can clog up the underdrain systems. Some OH slag sources clog up underdrain systems and some do not. Tufa performance verification will be based on field performance and Department's inspection of the underdrain systems.

Tufa performance verification is required for OH slag used for Item 304, or when OH slag is used for a non-surface course applications in Items 617, 410 or 411.

The producer shall submit to the Department past projects that are at least 10 years old that used the proposed OH slag source. The producer shall supply the Department with construction plans with the underdrains and underdrain outlets marked on the plans, or other suitable method, approved by the Department, showing the underdrain system. The producer shall mark the underdrain outlets in the field for inspection. The Department will inspect the underdrain systems for tufa deposits. If tufa deposits are found in the outlets or in the underdrain system, the OH slag source shall be rejected.

The following sources have previously been evaluated for tufa performance: Standard-Lafarge's Cuyahoga Heights and McDonald plants. Tufa performance verification is not required for these sources.

Aging and Stockpiling Requirements. All OH and BOF slag shall be stockpiled and aged as follows:

The material shall be graded and stockpiled into maximum size piles of 23,000 Metric ton (25,000 ton). Prior to and during the stock piling operation, these materials shall have water added to provide a uniform moisture content not less than their absorbed moisture. The stockpile shall be maintained in a moist condition during the required stock piling period.

The producer shall mix the stockpile when the outside surface of the pile has crusted over. The Department will inspect the stock pile every 2 months to ensure no crusting occurs. Frozen stockpile material shall not be mixed. The aging period shall be suspended when the stockpile is frozen for more than one month.

This aging period shall be at least 6 months in duration and shall start over if any new material is added to the pile during the aging period.

Expansion Testing. After the aging and stock piling requirements have been met, expansion testing is required for OH slag used for Item 304 or when OH slag is used for a non surface course applications in Item 617, Item 410 or Item 411.

Expansion Testing shall be performed in accordance with Pennsylvania Department of Transportation PTM No. 130, the ODOT equivalent to this test or expansion testing acceptable to ODOT.

The producer shall hire an independent AASHTO accredited and ODOT approved laboratory to perform at least half of the expansion testing. At the producer's option, up to half of the required expansion testing may be performed by the producer's lab. The Office of Materials Management shall observe the expansion testing and approve each independent and producer laboratory.

The expansion testing shall be performed for every 2300 metric tons (2500 tons) or fraction thereof of the material supplied.

The maximum allowable total expansion for each test shall be less than 0.50 percent. If any one test fails in the stockpile, the entire stockpile shall be rejected.

When sampling for expansion, the producer shall notify the Department at least 48 hours prior to the sampling. The Department will verify that the sample came from the correct stock pile and take independent spit samples , if required.

The expansion test data and a suitably presented summary of the expansion test data shall be submitted to the Department for approval. The Department reserves the right to perform independent testing to verify the laboratory results at any time.

The Department expansion test data shall take precedence over the producer or independent laboratory expansion testing results in the event of a conflict. The Department shall make the final determination on all conflicting data.

If the material fails the expansion testing, the material shall be stock piled for a minimum of 2 additional months from the date of last sampling and retested for expansion. No materials shall be approved for use until the material passes the expansion test.

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENTAL SPECIFICATION 906**

ANTISTRIP ADDITIVE FOR ASPHALT CONCRETE

May 5, 1998

On this project, if any gravel coarse aggregate or more than 25 percent natural sand or more than 20 percent reclaimed materials containing gravel coarse aggregate is used in any bituminous aggregate base designed in accordance with Supplement 1044 or any asphalt concrete designed in accordance with 441, then the Contractor shall perform the following additional tests:

1. Moisture damage potential test in accordance with Supplement 1051.
2. Washed gradation in accordance with AASHTO T 11 as modified by Supplement 1004.
3. Adherent fines test for each component in accordance with ASTM D 5711.

If the results of the moisture damage potential test show the Tensile Strength Ratio (TSR) of the bituminous aggregate base mix or asphalt concrete mix to be less than 0.70, then the mix shall be modified by one of the following antistrip additives:

Liquid Antistrip Material - The mix shall include liquid antistrip material at a rate of 0.50 to 1.00 percent by weight of the asphalt cement. The TSR of the bituminous aggregate base mix or asphalt concrete mix shall be greater than or equal to 0.80 after the addition of the liquid antistrip material.

Hydrated Lime - The mix shall include hydrated lime in the dry form at a rate of 1.0 percent by the dry weight of aggregate for asphalt concrete and 0.75 percent by the dry weight of aggregate for bituminous aggregate base. The hydrated lime shall meet the requirements of AASHTO M 303, Type 1. A list of approved sources of hydrated lime will be maintained by the Laboratory. To become an approved source, a source shall submit certified test data to the Laboratory showing their hydrated lime meets the requirements of AASHTO M 303, Type 1. Annual submittal of certified test data by January 1 each year will be necessary to maintain approval. The following information shall be provided to the Engineer for each shipment of hydrated lime: (1.) letter of certification; (2.) production date; (3.) shipment date; (4.) shipment destination; (5.) batch or lot number (6.) net weight.

The antistrip additive shall be included in the Contractors' mix design established in accordance with 441 or Supplement 1044. The following shall be submitted to the Laboratory with the proposed JMF:

1. All TSR data (before and after the addition of the antistrip additive).
2. Rate of addition of the liquid antistrip material, if used.
3. Product information, recent supplier State project information using the liquid antistrip material, and letter of certification (only for liquid antistrip material, if used).
4. Results of the washed gradation test of the individual components of the mix used in determining the combined gradation.
5. Results of the adherent fines testing for each component.

The Laboratory may perform additional tests in accordance with Supplements 1051, 1052, and 1004. These tests may be performed on material conforming to a proposed JMF or on material obtained during production of an approved JMF. If a change in the aggregate production is suspected, the District/Laboratory may require the Contractor to perform washed gradations on components and calculate adherent fines to determine the need for additional TSR review. The Laboratory may obtain samples of the hydrated lime at any time to verify quality. If the quality of the hydrated lime is in question, the Laboratory may require independent laboratory testing for the hydrated lime supplier.

Antistrip additives shall be stored and introduced into the mix in accordance with Supplement 1053. Prior to the start of production, the Laboratory shall approve the antistrip additive storage and feed systems. During production, if the antistrip additive is not being properly dispersed into the mix, the Laboratory may require modifications in the method of introducing the antistrip additive into the mix.

At the end of the project and at the end of each construction year on a multiple year project, the Contractor shall provide delivery tickets to the Engineer verifying the number of pounds of antistrip additive used is within 10 percent of the calculated amount of antistrip additive required for the total pounds of bitumen, based on the JMF, used in the bituminous aggregate base or asphalt concrete.

The cost of this additional testing and the addition of any antistrip additive shall be included in the contract price for the bituminous aggregate base or asphalt concrete.

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

SUPPLEMENTAL SPECIFICATION 907

**Sulphur Leachate Test for Air Cooled Blast Furnace Slag for Acceptance
of Items 203, 304, 306, 307, 503, 603 and S.S.855 (Asphalt Treated Free Draining Base)**

October 21, 1998

907.01 Description

907.02 Sampling Procedure

907.03 Sulphur Leachate Test Procedure and Criteria

907.01 Description. Air cooled blast furnace slag used in Items 203, 304, 306, 307, 503, 603, and S.S.855 (Asphalt Treated Free Draining Base) must meet the requirements of this specification. This specification contains the required sampling procedure; sulphur leachate test procedure; and, the criteria that must be met for the material to be incorporated into the work.

907.02 Sampling Procedure. The following sampling method for obtaining samples of air cooled blast furnace slag for leachate tests shall be used:

1. Sampling: The material to be used should be sampled as the stockpile is being built.
2. When obtaining the sample after the stockpile is built: The sample may be taken by shovel or hand. The sample shall be selected randomly from both the exterior and interior of the stockpile. The producer shall use a heavy equipment for the excavation of the interior material.
3. Sampling Frequency: Each sample is to be taken in random increments over each 5200 tons (4720 metric tons) stockpiled.
4. Sample size and sample reduction: The field sample should be 80 to 100 pounds (35 to 45 kg). From this field sample, a test sample of 20 to 25 pounds (9 to 11 kg) shall be quartered out.
5. Documentation : Stockpile location and test results shall be maintained at the plant and shall be available upon request.

6. The Producer shall certify that this test has been performed prior to acceptance.

907.03 Sulphur Leachate Test Procedure and Criteria. The test procedure involves soaking the slag material in water for a specified period of time and then observing the color of the water. A greenish-yellow coloration indicates a problem. The smell of hydrogen sulfide (rotten eggs) usually accompanies the observation of colored water.

1. Equipment Needed:

- A. A five-gallon (19-liter) bucket for soaking the sample.
- B. Filter paper for filtering the water.
- C. A funnel through which to filter the water.
- D. A glass container for observing the water.
- E. A rock color chart. This chart is used for color comparisons and is distributed by the Geological Society of America
- F. Water shall be distilled or tap water let set in a bucket for a minimum of 12 hours.

2. Test Procedures.

A. Prepare a test sample of approximately 20 to 25 pounds (9 to 11 kg) from a field sample of approximately 100 pounds (45 kg).

B. For Item 306, Type 3 granular material in Item 603, and S.S.855 (Asphalt Treated Free Draining Base), the test sample should then be rinsed over a No. 4 (4.75mm) sieve to remove any fines that may be clinging to the larger particles.

C. Place the test sample in bucket and fill with water until the sample is covered by at least ½ inch (13 mm) of water. Allow the sample to soak for 24 hours.

D. After soaking for 24 hours, thoroughly mix the water and collect a water sample of approximately 3.4 fl. oz. (100 mL).

E. Filter the water sample to remove the suspended solids which may interfere with the color observation.

F. If the color of the filtered water is equal to or darker than the moderate greenish-yellow color from the rock chart (hue 10Y), the material fails. If the water appears clear or lighter than the moderate greenish-yellow color from the rock chart (hue 10Y), then allow the sample to soak for another 24 hours and repeat steps "D" through "F".

G. If, after 48 hours, the water appears clear or less than the moderate greenish-yellow color from the rock chart (hue 10Y), then the material is acceptable.

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

SUPPLEMENTAL SPECIFICATION 908

PERFORMANCE GRADE (PG) BINDER REQUIREMENTS

March 28, 2000

- 908.01 Performance Grade Binder Specifications**
- 908.02 Contractor Storage Requirements**
- 908.03 Contractor Sampling Requirements**

908.01 Performance Grade Binder Specifications. The requirements of 702.01 shall be replaced with AASHTO Provisional Standard MP1-93, 1997 AASHTO Provisional Standard version for Performance Graded (PG) binders as modified below:

PG 64-22 shall meet: Penetration, 77°F (25°C), 3.53 oz (100g), 5s -	55 - 75
PG 58-28 shall meet: Viscosity, poise, 140°F (60°C)-	800 min

The Materials and Manufacture section 5 shall be modified for all performance grades (PG) as follows:

- 5.1 The performance grade binder shall be an asphalt cement from the refining of crude petroleum, or combination of asphalt cements from the refining of crude petroleum, or asphalt cements and suitable liquid from the refining of crude petroleum, and possible organic modifiers for performance enhancement. Material from the crude refining stream will be considered neat. Liquid from crude refining may be used for adjustments but shall not be used for the purpose of substitution of crude refined asphalt cement in a performance grade asphalt binder. In the event of a failure investigation where binders exhibit unusual properties a supplier may be requested by the Office of Materials Management to supply information about the makeup of a PG binder. Failure to cooperate will mean removal from certification.
- 5.2 A modifier may be any organic material of suitable manufacture that is proven compatible with asphalt cement (does not separate appreciably in routine storage), and that is dissolved, dispersed or reacted in asphalt cement to improve its performance. Performance enhancement is defined as a decrease in the temperature susceptibility of the asphalt cement while maintaining or improving desirable properties in a neat asphalt cement such as coatability, adhesiveness and cohesiveness. The use of modifiers shall be limited to 6.0 percent by performance grade binder weight.
- 5.3 The use of previously used materials must be approved by the Department. Since no standard test procedures exist for reprocessed materials (and original tests were not

developed with the use of such materials in mind), appropriate test methods may be chosen by the Department for review. Department approval does not relieve the performance grade binder supplier from full responsibility for content and use of any previously used material nor guarantee suitable performance enhancement as defined above. The detected presence in a performance grade binder sample of any unapproved previously used material will mean immediate removal from certification. Approved reprocessed materials will be limited to 6.0 percent by performance grade binder weight.

- 5.4 The performance grade asphalt binder shall be homogeneous, free from water and deleterious materials, and shall not foam when heated to 350°F (175°C). The asphalt binder (before modification or after modification if liquid modifier used) shall be proven fully compatible with a negative result by means of the Spot Test per AASHTO T 102 using standard naphtha solvent. If standard naphtha shows a positive result, a retest using 35 percent Xylene/ 65 percent Heptane (volume) may be used.
- 5.5 The performance grade asphalt binder shall be at least 99.0 percent soluble as determined by ASTM D 5546 or D 2042. Any insoluble component shall be substantially free of fibers and have discrete particles less than 75µm.

908.02 Contractor Storage Requirements. Storage of a performance grade binder shall be in accordance with 750.01, with the following additions:

- 1. If a Contractor is providing a binder other than a performance grade binder to customers other than the Department (excepting winter carryover work), a separate storage tank shall be used.
- 2. When the Contractor switches between different performance grade binders because of alternating mix types, a separate storage tank shall be used.
- 3. When the Contractor switches from any asphalt cement or other performance grade binder to a different performance grade binder using the same storage tank, the storage tank shall be at least 90 percent empty by tank height.

The Monitoring Team shall be notified before the delivery of the first load of each type of performance grade binder, with sufficient lead time to allow for verification of the condition of the storage tank. The Monitoring Team may sample the first storage tank load or give the Contractor permission to proceed with no tank verification, at their discretion.

908.03 Contractor Sampling Requirements. The Contractor shall take two 1 quart (1 liter) samples from the first transport truck load of performance grade binder before incorporation into the storage tank. The Contractor will label and date the samples and retain them in the plant laboratory for future reference by the Department, if necessary.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 932
GRAY IRON AND DUCTILE IRON CASTINGS
FOR MANHOLES, CATCH BASINS AND INLETS

October 2, 1996

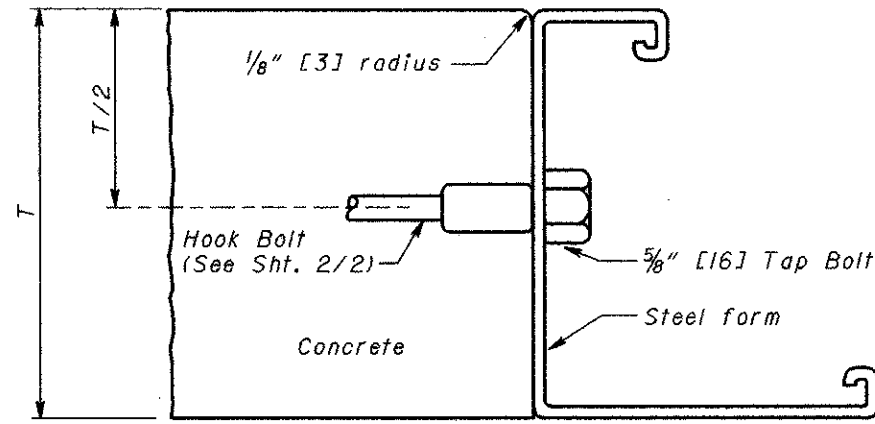
- 932.01 Description
- 932.02 Material
- 932.03 Design Approval
- 932.04 Testing and Certification.

932.01 Description. This specification applies to castings for frames, grates and covers for manholes, catch basins and inlets that vary from Items 711.12 and 711.13 and from the designs detailed on the Standard Construction Drawings.

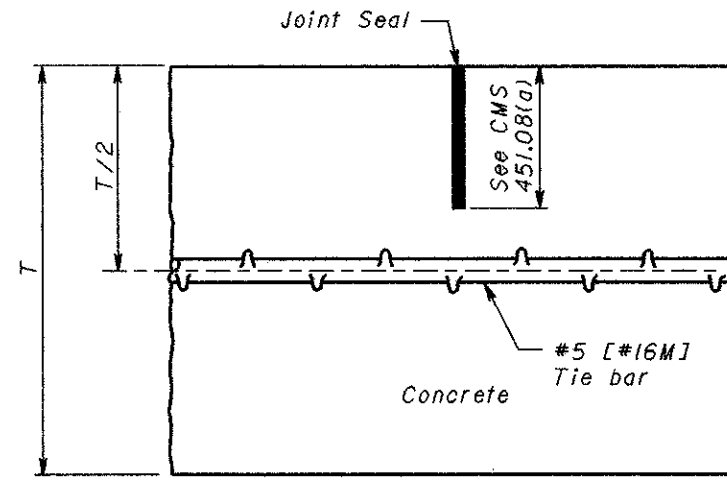
932.02 Material. Gray iron and ductile iron castings shall comply with the requirements of AASHTO M306, Class 35B.

932.03 Design Approval. Designs for cast frames, grates and covers for manholes, catch basins and inlets that vary from the standard construction drawings must be submitted to the Office of Roadway Engineering for approval prior to being accepted. Manufacturers shall seek approval for such non-standard designs well in advance of a project's sale date.

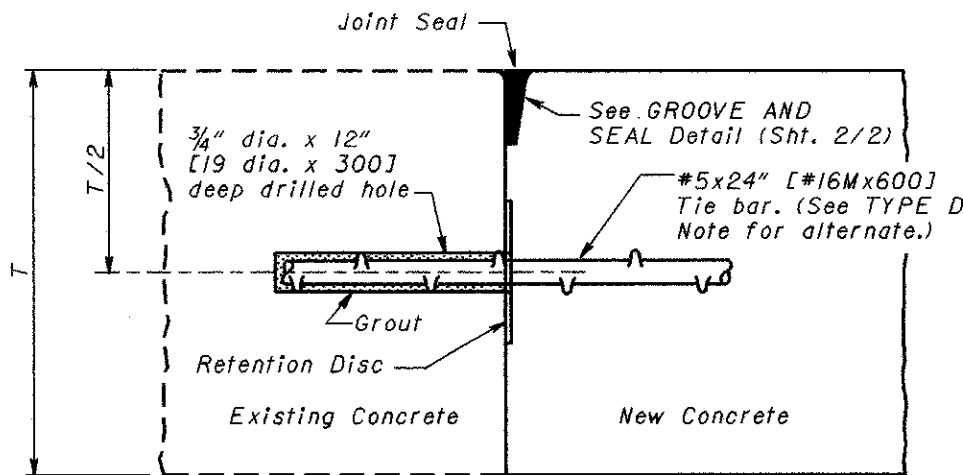
932.04 Testing and Certification. Test bars are required as outlined in 711.12 and 711.13. In addition, certified test data for monthly proof load testing shall be submitted to the Office of Materials Management with each inspection of castings from that month.



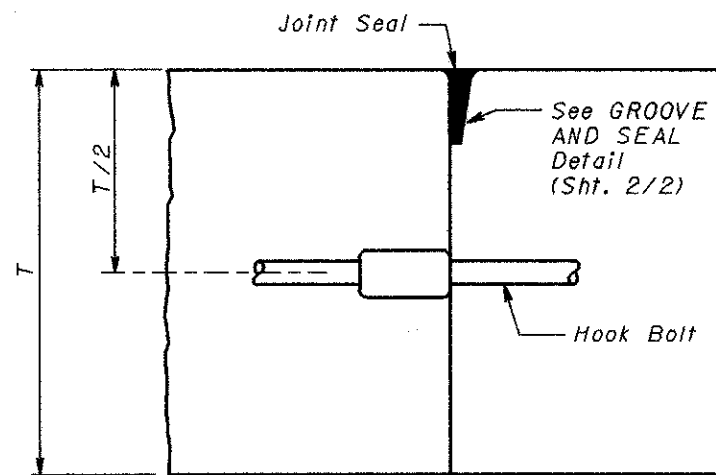
ACCEPTABLE METHOD OF FORMING JOINT



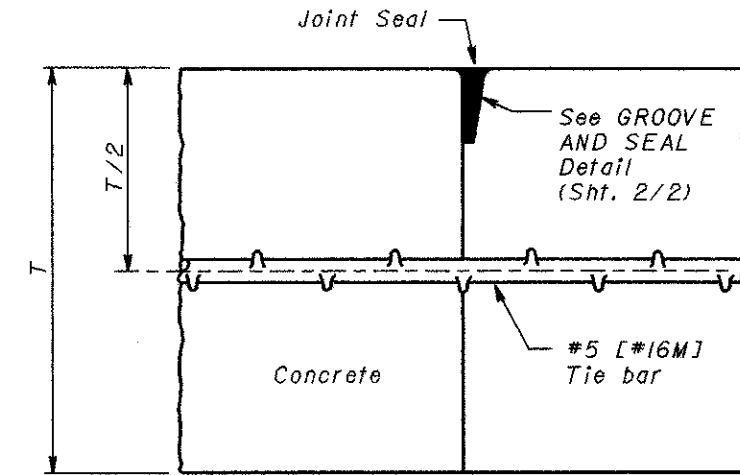
SAWED JOINT



TYPE D (DRILLED TIED LONGITUDINAL) JOINT



BUTT JOINT
w/ HOOK BOLT



BUTT JOINT
w/ TIE BAR

NOTES

GENERAL: Longitudinal joints shall be used when specified on the typical section and shall be constructed as shown on this drawing in Items 451 and 452 Pavement and Item 305 Base.

The joint shall be on the centerline of the pavement unless otherwise shown on the plans. Where the pavement width exceeds 16' [5.0 m], an additional longitudinal joint shall be introduced into the jointing details as directed by the Engineer.

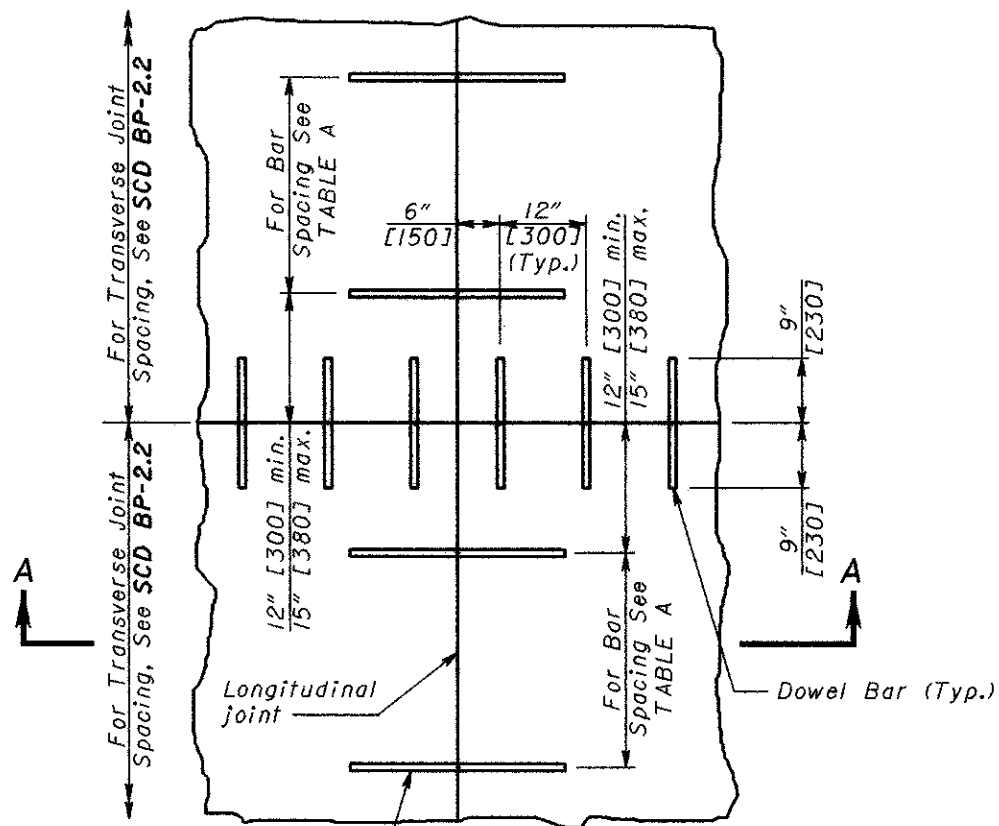
Tie bars shall be #5 [#16M] deformed bars. A satisfactory device shall be used to hold the tie bars in proper position or they may be installed by a mechanical installing device. Tie bars shall be centered on the longitudinal joint as nearly as practical.

BUTT JOINT: The longitudinal joint between adjoining slabs poured in separate operations shall be a butt joint with hook bolts or tie bars, unless otherwise shown on the plans. Bent tie bars shall not be permitted.

TYPE D (DRILLED TIED LONGITUDINAL) JOINT: Type D joints shall be constructed in accordance with CMS 255.05. The nylon or plastic retention disc shall be clear or opaque white in color. Grout shall meet the requirements of CMS 255.02. 5/8" [16] expansion anchors, FF-S-325, Group VIII, Type I or Group II Type 4, Class I may be used lieu of the #5x24" [#16Mx600] deformed bar and shall be installed according to the manufacturer's recommendations.

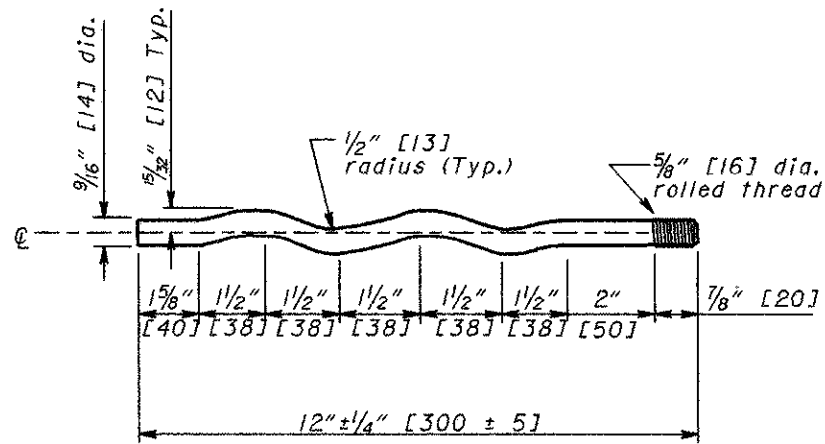
The use of self drilling expansion shield anchors, FF-S-325, Group III, Type I (a) and (c) shall not be permitted.

See Sheet 2/2 for additional details.

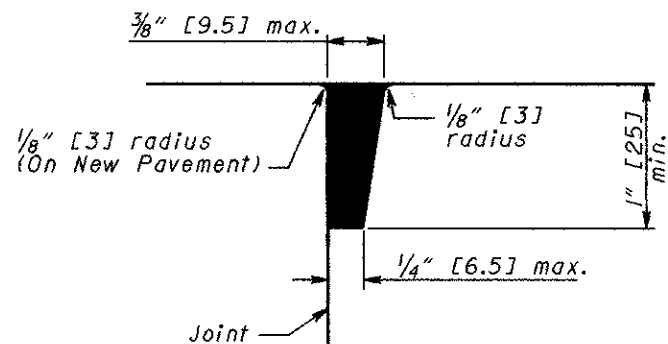


Hook bolt or #5x30" [#16Mx760] Tie Bar (Typ.)

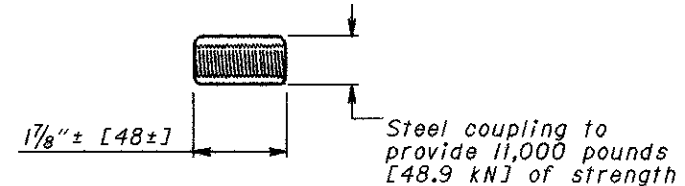
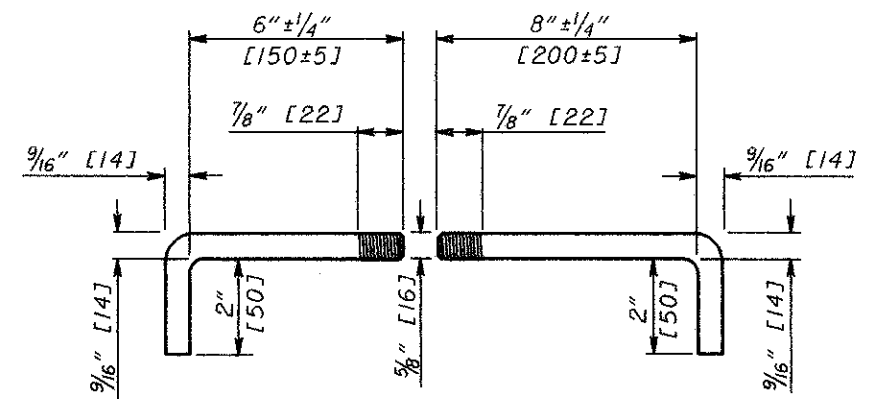
PLAN



HOOK BOLT ALTERNATE



GROOVE AND SEAL DETAIL



HOOK BOLT

NOTES

GROOVES: Grooves for sealing expansion bolt or butt joints in Item 451 or 452 pavements shall be formed by depressing a device or bar into the newly deposited concrete adjacent to the existing or previously poured lane. The device or bar shall be removed as soon as the concrete is in such condition as to preclude distortion of the concrete.

Adjoining slabs adjacent to grooved joints shall be edged with a thin metal edger having a radius of 1/8" [3]. Any impression left in the surface of the pavement by the flat part of the edging tool shall be eliminated.

In lieu of the above method the longitudinal joint may be constructed in accordance with CMS 451.08(a).

After the joint is formed it shall be protected from dirt and foreign matter until the joint seal is placed.

SEALING JOINTS: Sawed or hand-formed joints may be sealed with CMS 705.04 or 705.11 joint sealer.

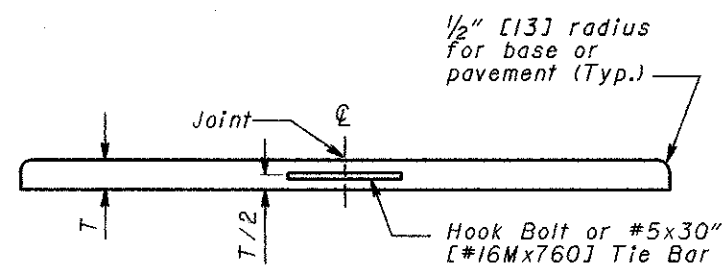
HOOK BOLTS: Threaded hook bolts and alternates shall be turned to a tight fit when installed in couplings.

METAL STRENGTH: Tie bars, hook bolt assemblies and the hook bolt alternate shall have a minimum strength of 11,000 pounds [48.9 kN].

SPACING: Tie bars shall not be located within 12" [300] of any transverse joint.

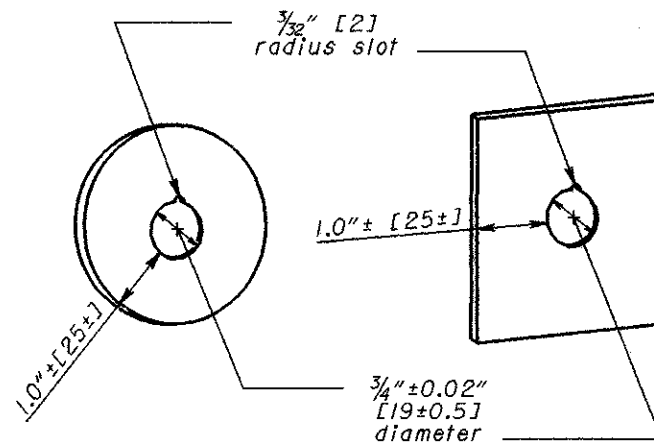
ROADS

TABLE A			
Thickness of Pavement	Transverse Joint Spacing	Number of Tie Bars per Slab	Max. spacing between Tie Bars
10" [250] or less	15' [4.6 m]	7	26" [660]
	21' [6.5 m]	10	26" [660]
Greater than 10" [250]	15' [4.6 m]	9	20" [508]
	21' [6.5 m]	13	20" [508]



SECTION A-A

TIE BAR OR HOOK BOLT SPACING

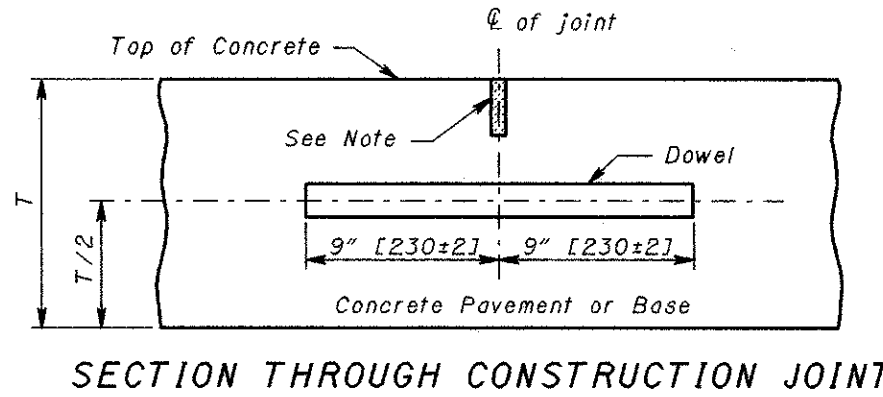
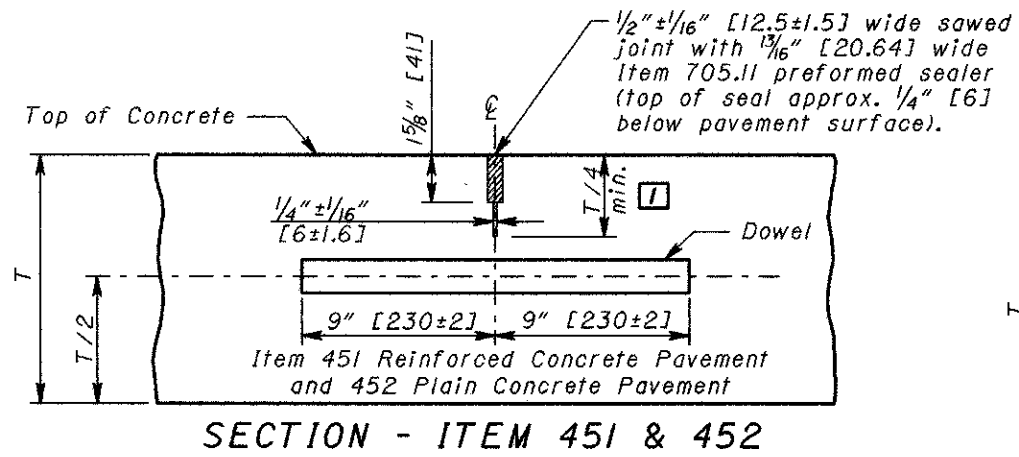


NYLON OR PLASTIC GROUT RETENTION DISCS FOR DOWEL/TIE BARS

(1/16" [1.6] min. thick)

THIS DRAWING REPLACES BP-2.1M DATED 4-8-97.

OHIO DEPARTMENT OF TRANSPORTATION
 ROADWAY DESIGN ENGINEER
 REVISIONS
 STDS. ENGR. M. Evans
 DRAWN D. Focke
 ROADWAY ENGINEERING SERVICES
 LONGITUDINAL PAVEMENT JOINTS
 NUMBER BP-2.1
 2/2



NOTES

GENERAL: Notes and details shown on this drawing shall be considered in conjunction with and supplemental to the pertinent specifications for portland cement concrete pavement and bases, and related incidentals.

JOINT COMPONENTS: This drawing is intended for use with a uniform depth pavement. When the project involves the placing of variable depth pavement, the joint components shall be held in place in accordance with the method shown in the plans or as approved by the Engineer.

CONTRACTION JOINTS: Contraction joints in Item 305 Concrete Base shall be dowelled where they are located in mainline pavement, ramps, acceleration/deceleration lanes, or collector/distributor lanes, or in shoulders within 500' [150 m] of a pressure relief joint.

Contraction joints in Item 305 Concrete Base shall not be dowelled in alleys, private drives, or commercial drives.

Contraction joints of the type specified shall be spaced in accordance with the CONTRACTION JOINT SPACING Table.

CONTRACTION JOINT SPACING	
Types of Pavement or Base	Maximum Spacing Between Joints
Item 451 Reinforced Concrete Pavement	21' [6.5 m]
Item 452 Plain Concrete Pavement	15' [4.6 m]
Item 305 Concrete Base	15' [4.6 m]

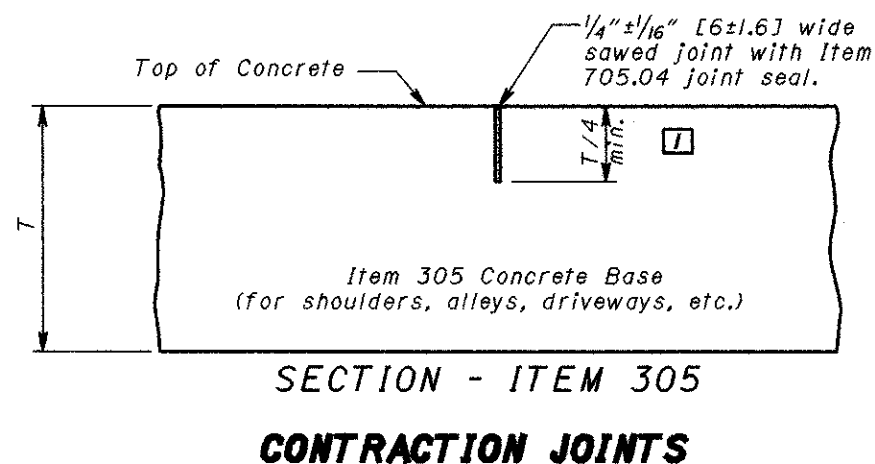
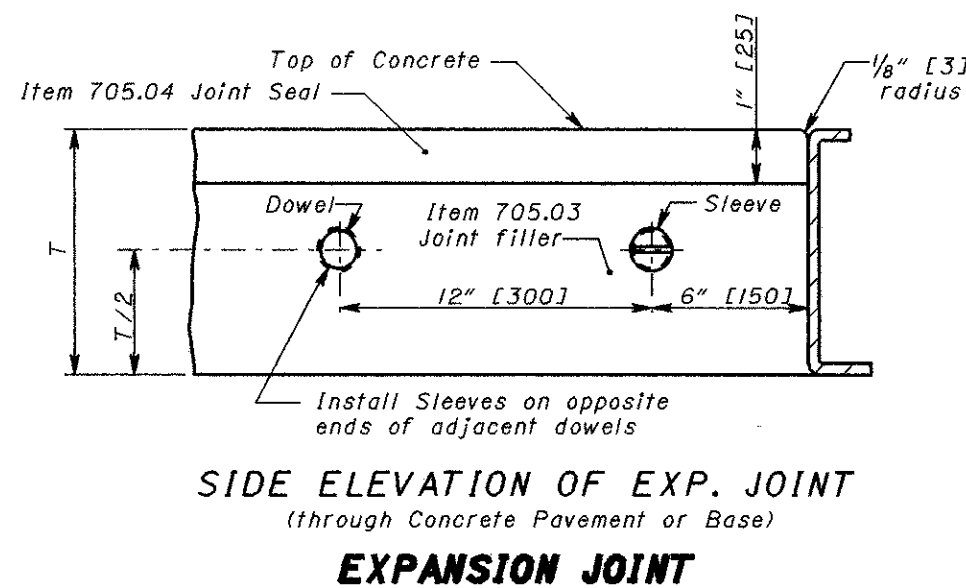
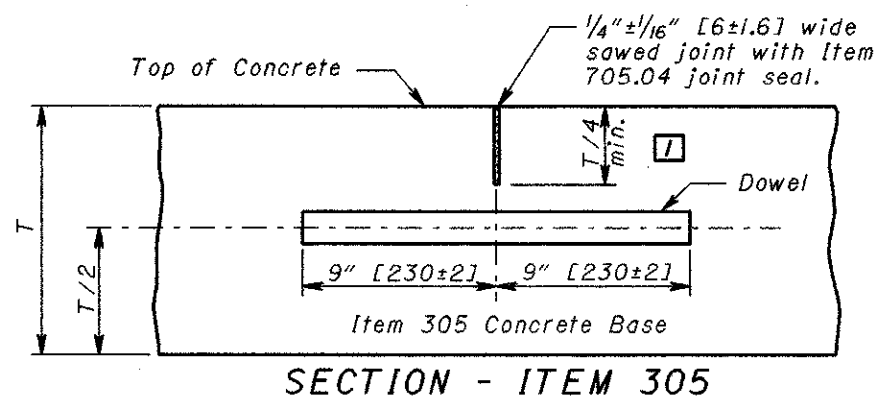
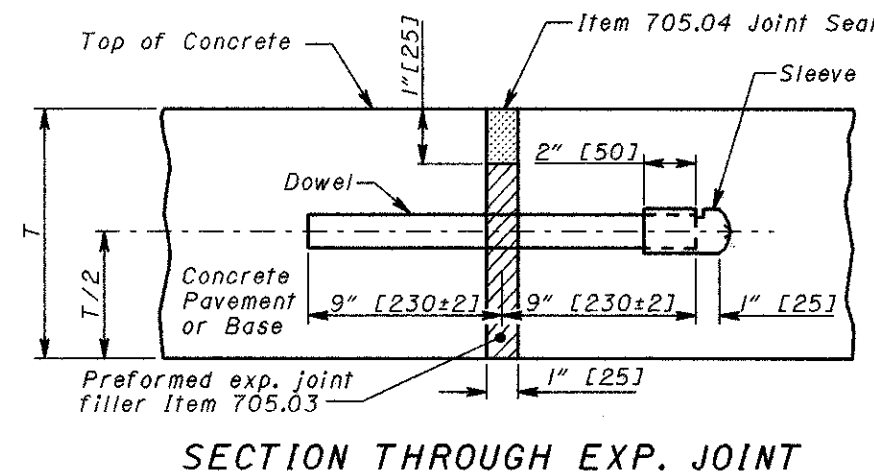
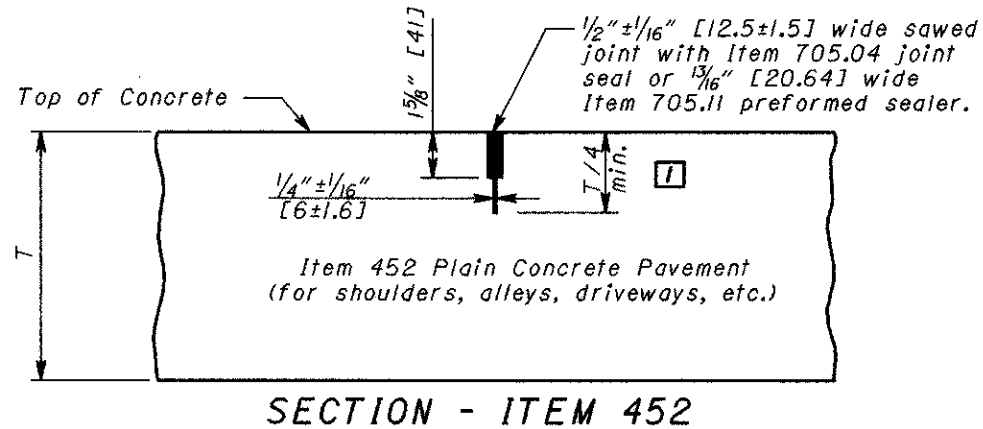
CONSTRUCTION JOINTS: In Item 305 Concrete Base, a construction joint shall not be located closer than 6' [1.8 m] to another parallel joint.

Kerf and seal conforming in all respects to details shown for contraction joints shall be provided at each construction joint in concrete pavement and base.

SEALING BASE CONTRACTION JOINTS: All contraction joints for concrete base shall be sealed as detailed on this drawing and the cost included in the unit price bid for Item 305.

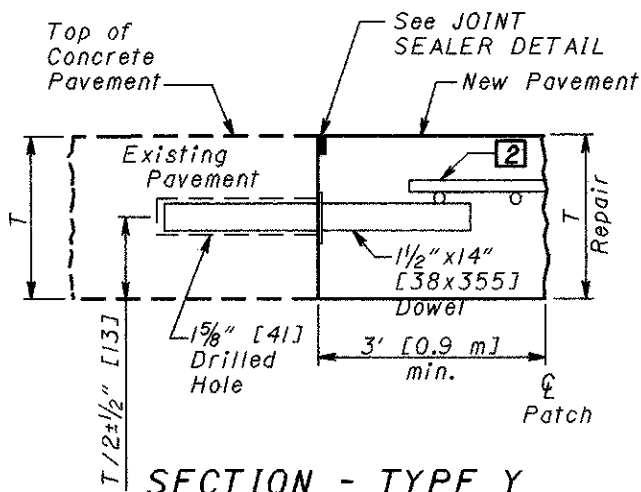
LEGEND

[] Where $T > 10$ [255], the sawcut depth shall be $T/3$.

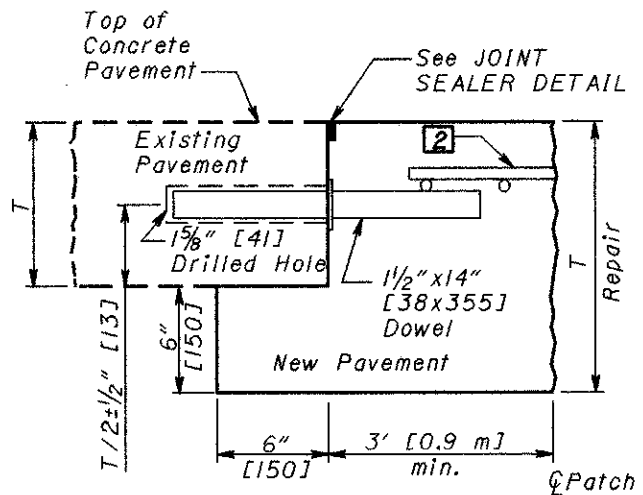


THIS DRAWING REPLACES BP-2.2M DATED 10-21-97.

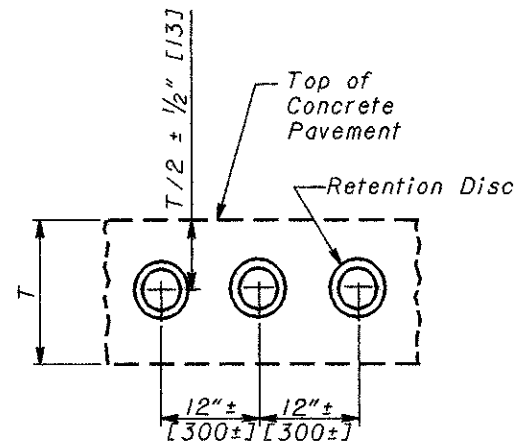
OHIO DEPARTMENT OF TRANSPORTATION
 REVISIONS
 STDS. ENGR. M. EVANS
 ROADWAY ENGINEERING SERVICES
 DRAWN D. Focke
 NUMBER BP-2.2
 STANDARD ROADWAY CONSTRUCTION DRAWING
 TRANSVERSE PAVEMENT JOINTS
 DATE 7-28-00



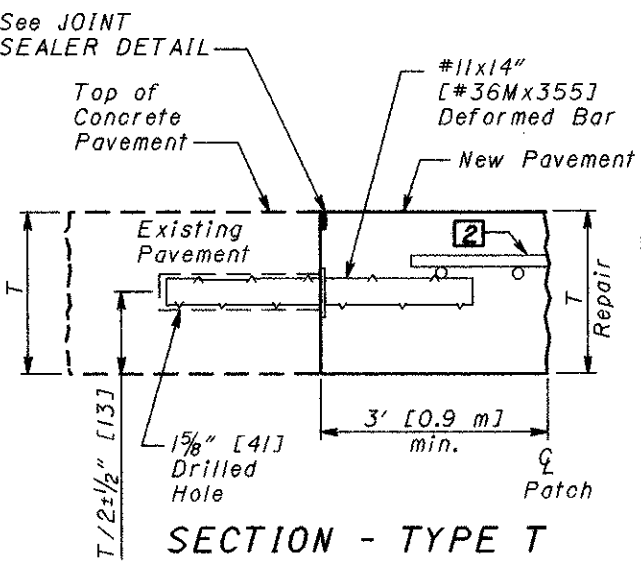
SECTION - TYPE Y
(Contraction)



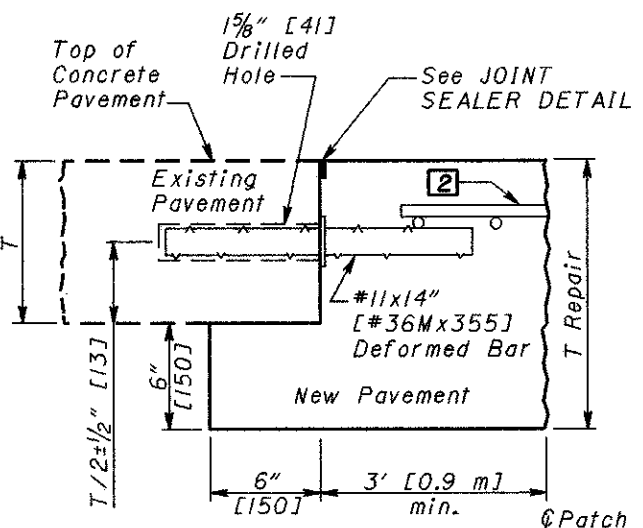
SECTION - TYPE YU
(Undercut + Contraction)



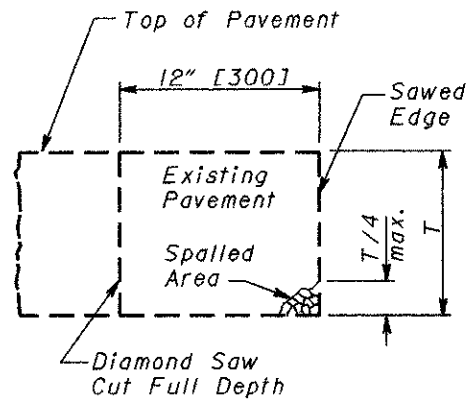
HOLE DRILLING DETAIL



SECTION - TYPE T
(Tied)



SECTION - TYPE TU
(Undercut + Tied)



ADDITIONAL PAVEMENT REMOVALS

NOTES

GENERAL: All joints shall be constructed normal to the centerline of the pavement lane unless otherwise specified in the plans.

All dowel holes shall be drilled by a mechanical device that will allow independent adjustment of all drill shafts in the horizontal and vertical direction. The device shall be capable of drilling a minimum of three holes at a time.

All smooth dowels shall be coated with a thin layer of oil or other "bond-breaking" material after they have been installed in the existing pavement and just prior to placing the patch. All dowels shall be placed parallel to the pavement surface and the centerline of the pavement lane.

This standard drawing is intended for use in repairing both concrete and composite pavements. For clarity, asphalt overlays are not shown.

When Prefabricated Edge Drains are used, they shall be placed after joint repairs are completed.

TYPE N JOINT: Joints referred to as Type N joints on the plan shall be constructed as contraction joints per **SCD BP-2.2**.

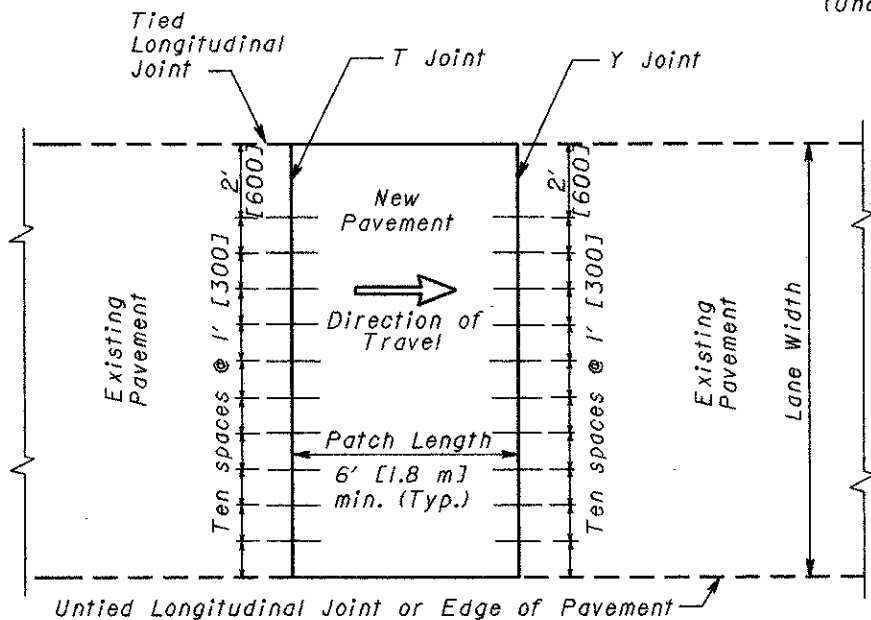
ADDITIONAL PAVEMENT REMOVAL: If, after the sawing and removal of the pavement from the area to be repaired, the face of the remaining pavement is spalled or deteriorated for a height greater than one-fourth (1/4) the thickness of the rigid pavement, an additional saw cut shall be made as shown and as directed by the Engineer. This additional work shall be measured for additional payment for full depth pavement sawing, rigid pavement removal and replacement.

LONGITUDINAL JOINT: For patches 10' [3.0 m] or greater in length, the longitudinal joint shall be constructed per **SCD BP-2.1**.

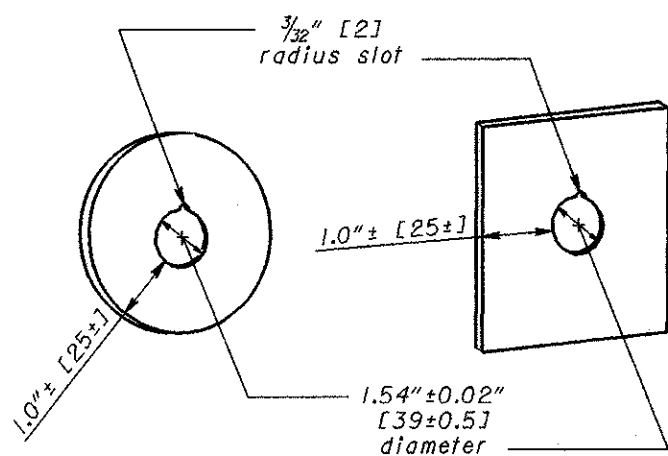
The tie bars or hook bolts shall be spaced at no more than 30" [760] nor less than 24" [610] on center.

LEGEND

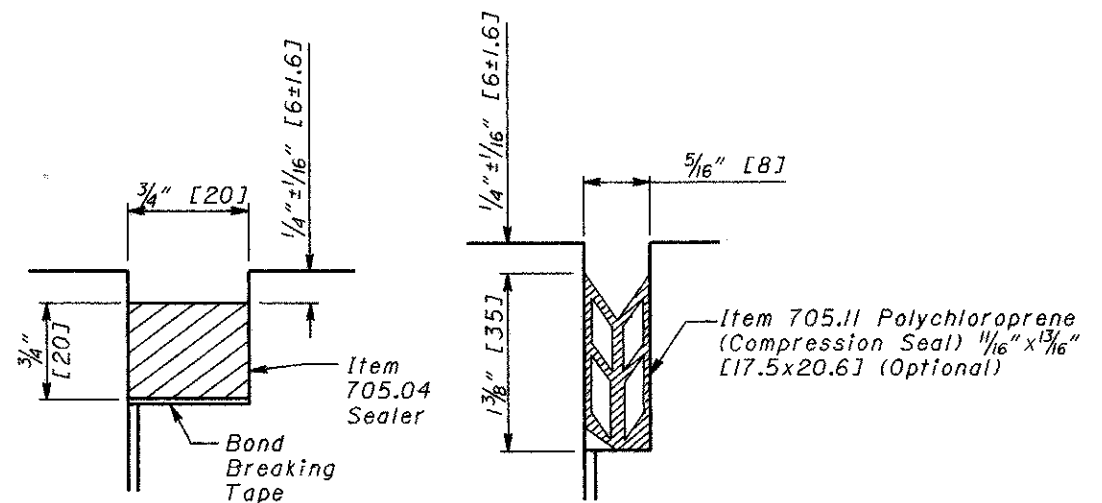
- 1 Bars shall be placed 2' [600] from the tied longitudinal joint and continue across with a 1' [300] spacing to the edge of pavement or an untied longitudinal joint. Where lane widths are between two tied longitudinal joints, begin bars 2' [600] from each tied longitudinal joint and continue across with a 1' [300] spacing.
- 2 Reinforcement will be required for all repairs greater than 10' [3.0 m] in length or for repairs that will be opened to traffic within 24 hours of placement. The fabric shall consist of W8.5 or D8.5 [MW55 or MD55] longitudinal wires spaced 6" [150] c/c and W4 or D4 [MW26 or MD26] transverse wires spaced 12" [300] c/c. The clearance from the end of the wire fabric to the edge of pavement or new transverse joint shall be 4" +/- 2" [100 +/- 50].
- 3 Nylon or plastic grout retention discs shall be clear or opaque white in color.



TIE / DOWEL BAR PLACEMENT DETAIL
(See 1 for Bar Placement)

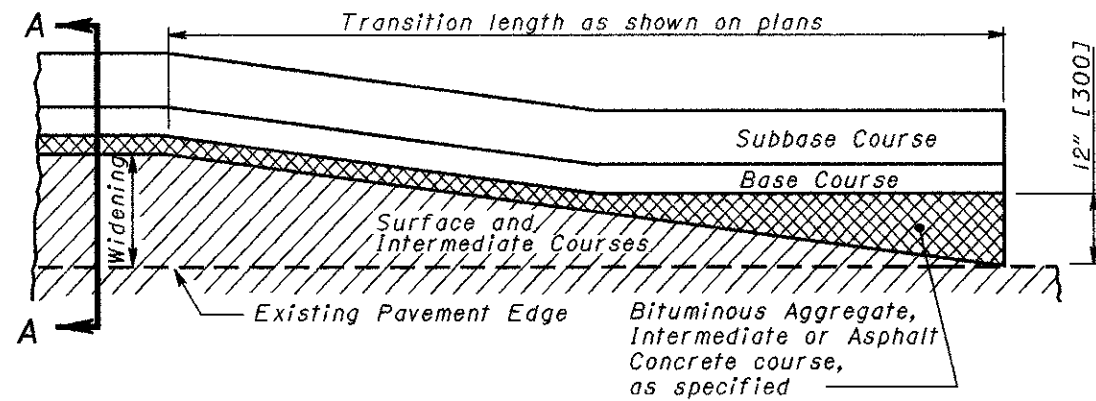


NYLON OR PLASTIC GROUT RETENTION DISCS FOR DOWEL/TIE BARS 3
(1/16" [1.6] min. thickness)



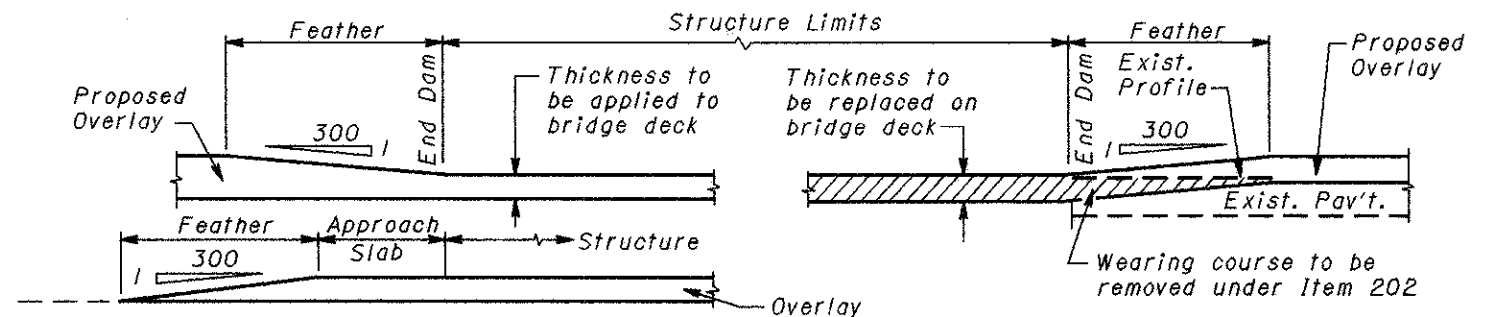
JOINT SEALER DETAIL

THIS DRAWING REPLACES BP-2.5M DATED 4-8-97.
 STANDARD ROADWAY CONSTRUCTION DRAWING
 ROADWAY ENGINEERING SERVICES
 RIGID REPLACEMENT
 NUMBER BP-2.5
 DATE 1/1
 STDS. ENGR. M. EVANS
 DRAWN D. FOCKE
 REVISIONS
 CIVIL DEPARTMENT TRANSPORTATION
 ROUTE 7-28-00
 ROADWAY DESIGN ENGINEER

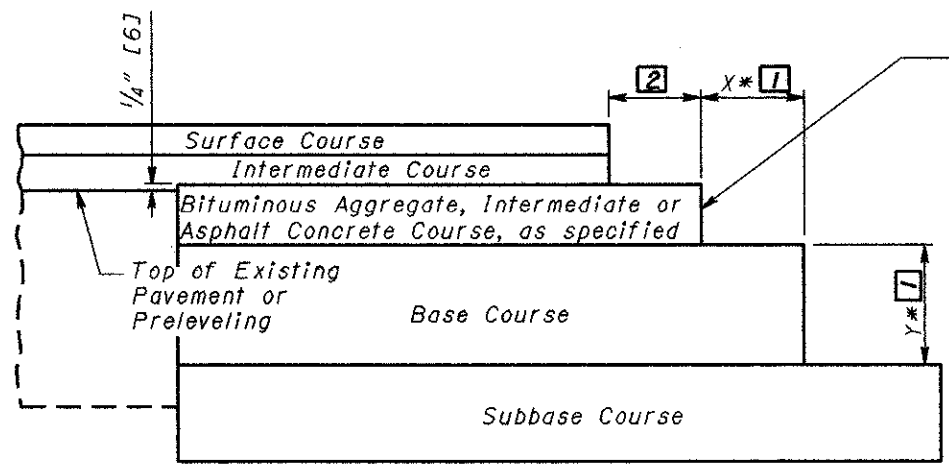


PLAN

MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



FEATHERING AT STRUCTURES



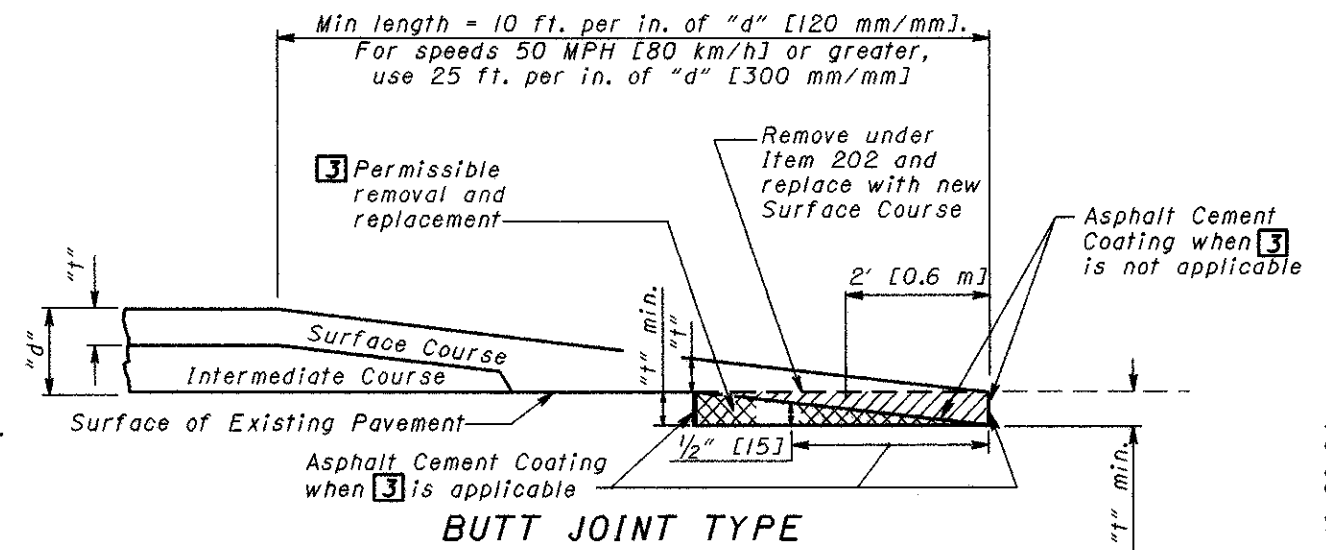
SECTION A-A

COURSE DETAIL FOR WIDENING

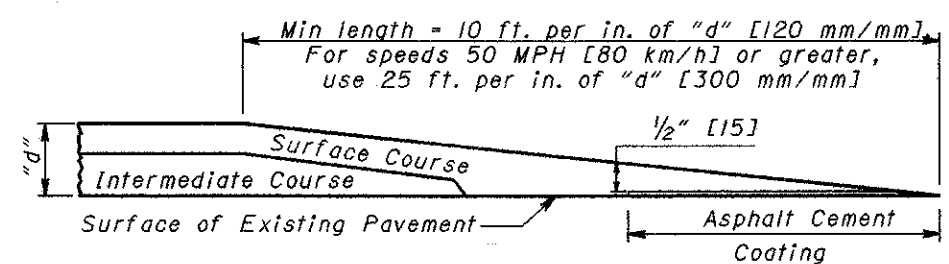
The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" [6] above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" [6] above the preleveling.

LEGEND

- 1 The extended width (X) of a base or subbase course shall be equal to the depth (Y) of that particular course, unless otherwise specified in the plans.
- 2 The extended width shall be equal to the thickness of the surface course plus the intermediate course, or 4 inches [100], whichever is greater.



BUTT JOINT TYPE

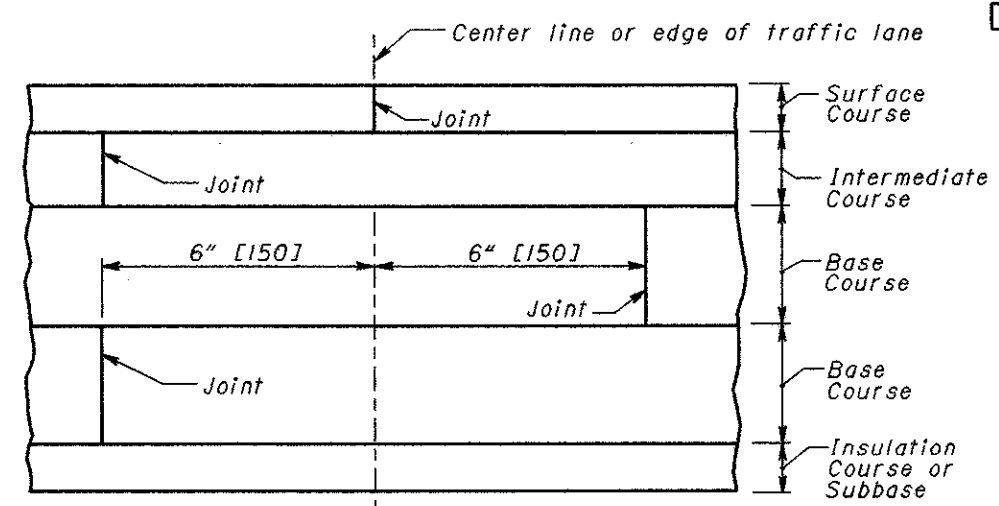


TAPER EDGE TYPE

NOTE: Either butt or taper type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS

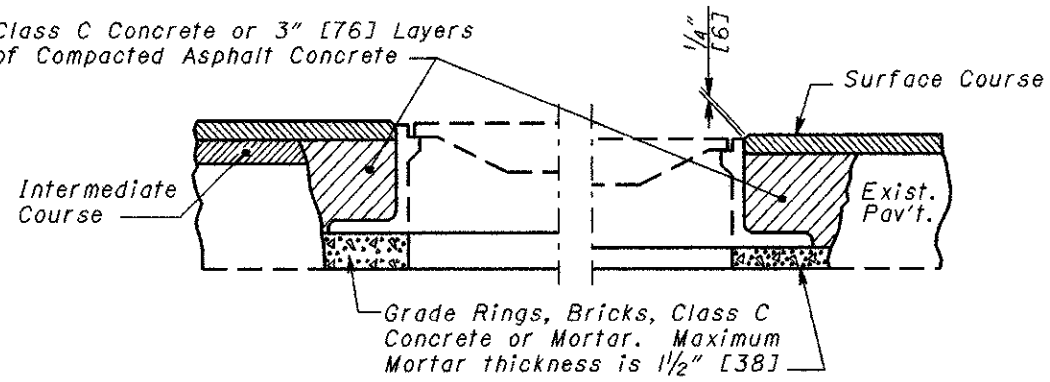
Values for "t" and "d" are obtained from the plan.



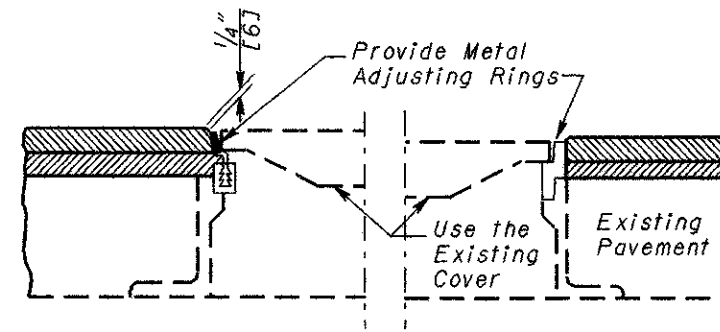
LAPPING LONGITUDINAL JOINTS

THIS DRAWING REPLACES BP-3.1M DATED 10-28-94.
 STANDARD ROADWAY CONSTRUCTION DRAWING
 ROADWAY ENGINEERING SERVICES
 RESURFACING
 NUMBER BP-3.1
 1/2
 OHIO DEPARTMENT OF TRANSPORTATION
 Paul T. Hubbard
 ROADWAY DESIGN ENGINEER
 DATE 7-28-00
 REVISIONS
 STDS. ENGR. M. EVANS
 DRAWN D. FOCKE

Class C Concrete or 3" [76] Layers of Compacted Asphalt Concrete



USING CONCRETE OR MORTAR



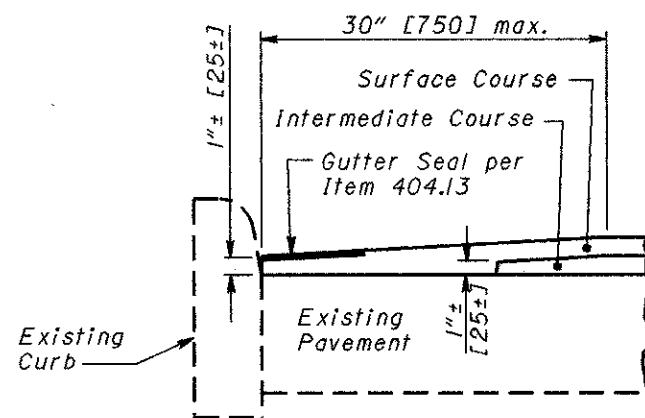
USING METAL ADJUSTING RINGS

Metal adjusting rings shall:

- (a) attach securely to the existing frame by welding or mechanical devices;
- (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and
- (c) provide an even seat for the manhole cover.

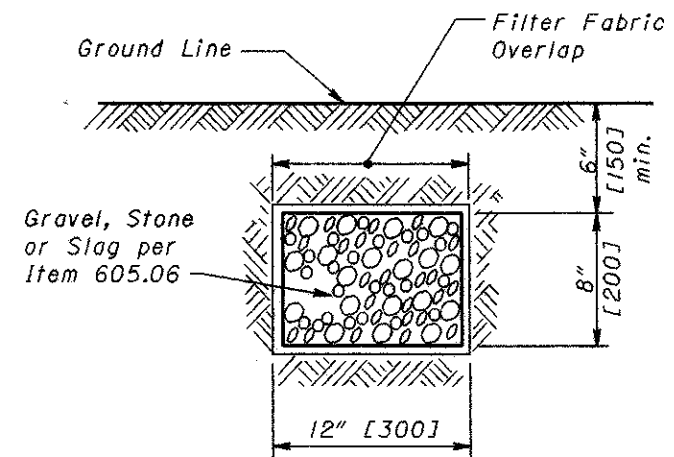
In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the Contractor at his expense.

MANHOLES ADJUSTED TO GRADE



Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

GUTTER FINISH



Aggregate drains to be placed where and as directed by Engineer. Provide Filter Fabric when specified as a separate pay item.

AGGREGATE DRAIN

THIS DRAWING REPLACES BP-3.I.M DATED 10-28-94.

STANDARD ROADWAY CONSTRUCTION DRAWING

RESURFACING

NUMBER
BP-3.I

2/2

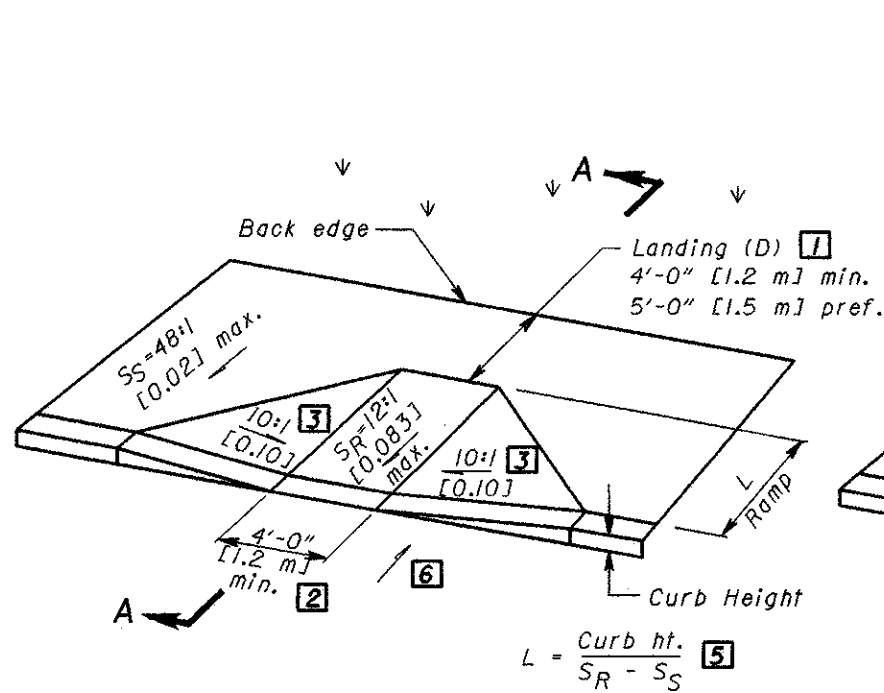
All metric dimensions (in brackets []) are in millimeters unless otherwise noted.

STDS. ENGR.
M. EVANS
DRAWN
D. FÖCKE

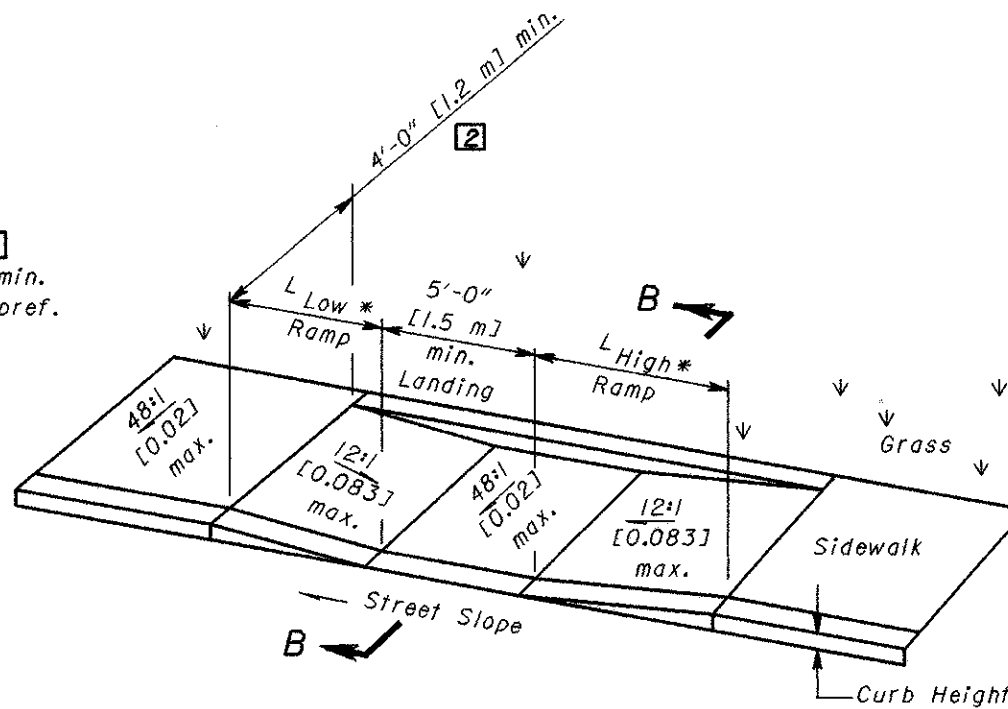
REVISIONS

DATE
-28-00
ROADWAY DESIGN ENGINEER
Kemp T. Siskland

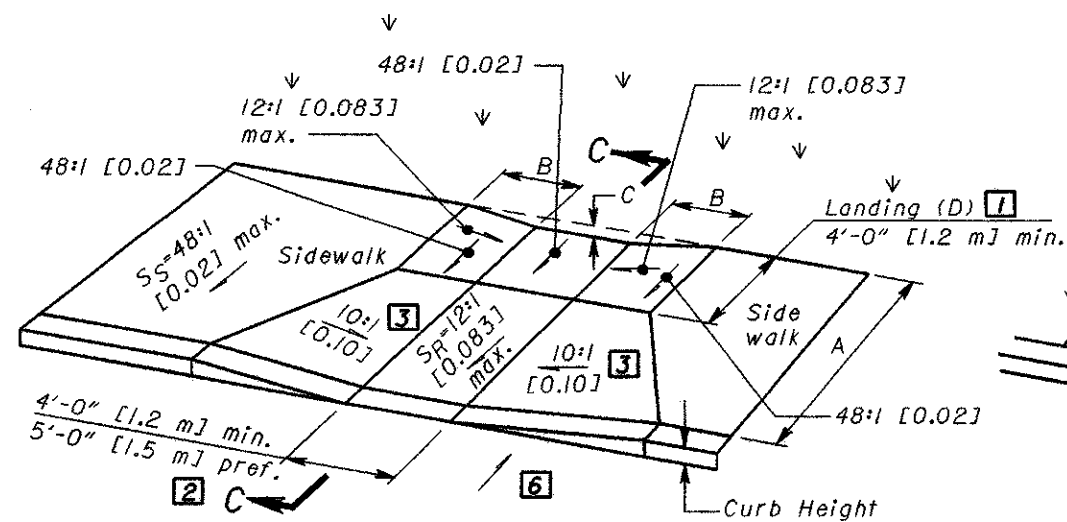
DEPARTMENT OF TRANSPORTATION



See Sht. 3/3 for SECTION A-A
PERPENDICULAR CURB RAMP DETAIL



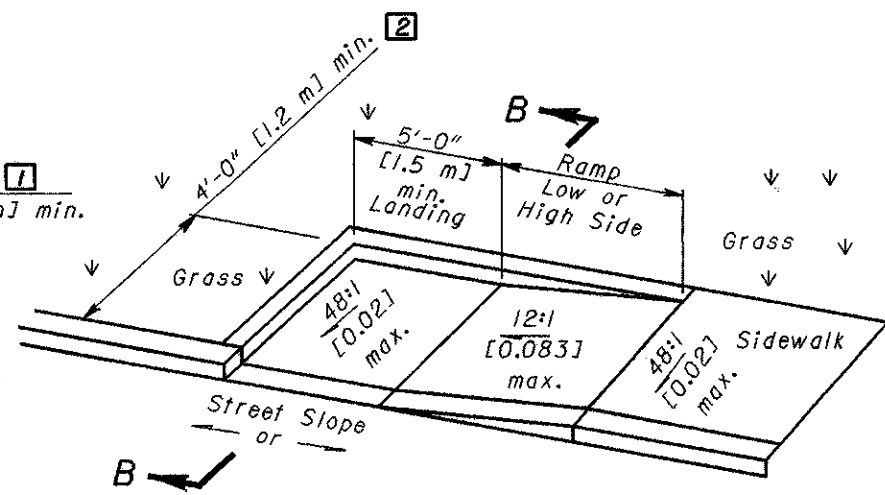
See Sht. 3/3 for SECTION B-B
PARALLEL CURB RAMP DETAIL (DOUBLE)



See Sht. 3/3 for SECTION C-C
COMBINED CURB RAMP DETAIL

$$B = C / 0.083$$

$$C = [Curb\ ht. + A(S_S)] - [(A-D)S_R + D(0.02)]$$



See Sht. 3/3 for SECTION B-B
PARALLEL CURB RAMP DETAIL (SINGLE)

Street Slope	Ramp Length @ 1"/ft [0.083]	
	L LOW SIDE*	L HIGH SIDE*
0.01	5'-5" [1.6 m]	6'-10" [2.1 m]
0.02	4'-10" [1.5 m]	7'-11" [2.4 m]
0.03	4'-5" [1.3 m]	9'-5" [2.9 m]
0.04	4'-1" [1.2 m]	11'-8" [3.6 m]
0.05	3'-9" [1.1 m]	15'-2" [4.6 m]

* Measured along the back of a 6" [150] high curb.

$$L_{HIGH} = \frac{Curb\ ht.}{0.083 - Street\ Slope}$$

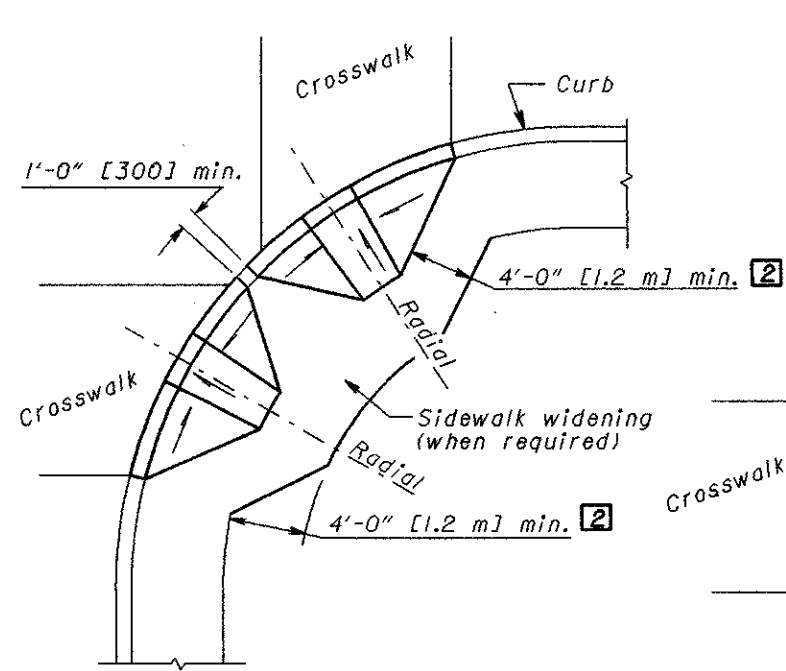
$$L_{LOW} = \frac{Curb\ ht.}{0.083 + Street\ Slope}$$

LEGEND

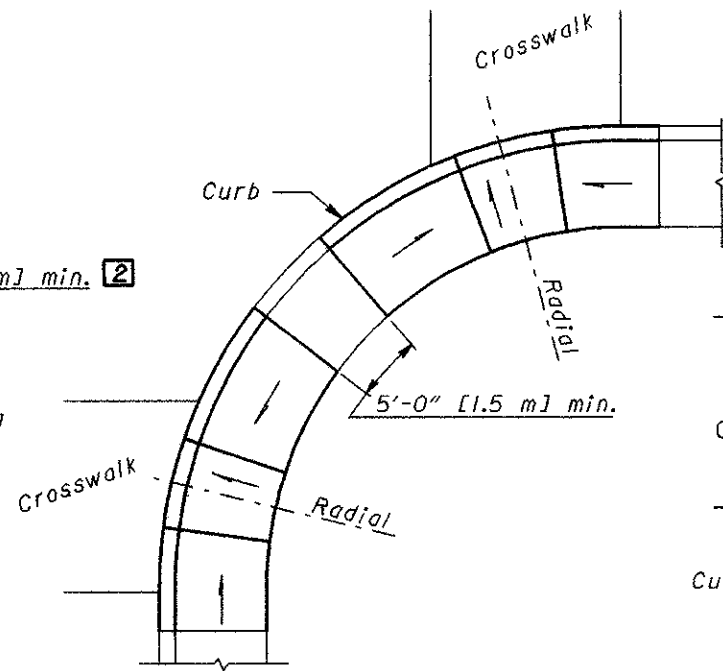
- 1 May be reduced to 3'-0" [915] in existing sidewalks if the landing is unconstrained along the back edge.
- 2 May be reduced to 3'-4" [1.02 m] in existing sidewalks to better fit the walk configuration or where site conditions are restricted by narrow walks, pole foundations, drainage inlets, etc. The width may be tapered.
- 3 Where landing width (D) has been reduced to 3'-0" [915] the flared sides shall have a maximum slope of 12:1 [0.083].
 Flared sides are not required where the edges of a curb ramp are protected by landscaping or other barriers to travel by wheel chair users or pedestrians across the edge of the curb ramp. However, if the flared sides are used in these areas, they may be of any slope.
- 4 The slope of the ramp toward the curb is preferred to be 12:1 [0.083] or flatter related to the horizontal, but the maximum slope shall be 12:1 [0.083] relative to the existing or proposed walk slope.
 In existing sidewalks, where the maximum ramp slope (SR) is not feasible, it may be reduced as follows:
 A) 10:1 [0.10] for a max. rise of 6" [150],
 B) 8:1 [0.125] for a max. rise of 3" [75],
 C) 6:1 [0.167] over a max. run of 2'-0" [610] for historic areas where a flatter slope is not feasible.
- 5 The minimum length of a perpendicular ramp is 6' [2.0 m] from the back of a 6" [150] curb and may be increased where feasible to obtain a flatter ramp slope or to better blend with the walk configuration.
- 6 Gutter counter slopes at the foot of perpendicular curb ramps should not exceed 20:1 [0.05] over a distance of 2'-0" [610] from the curb.
- 7 Dimensions derived by equation are nominal. Construct ramps to meet required slopes and existing conditions.

THIS DRAWING REPLACES BP-7.1M DATED 10-28-94.

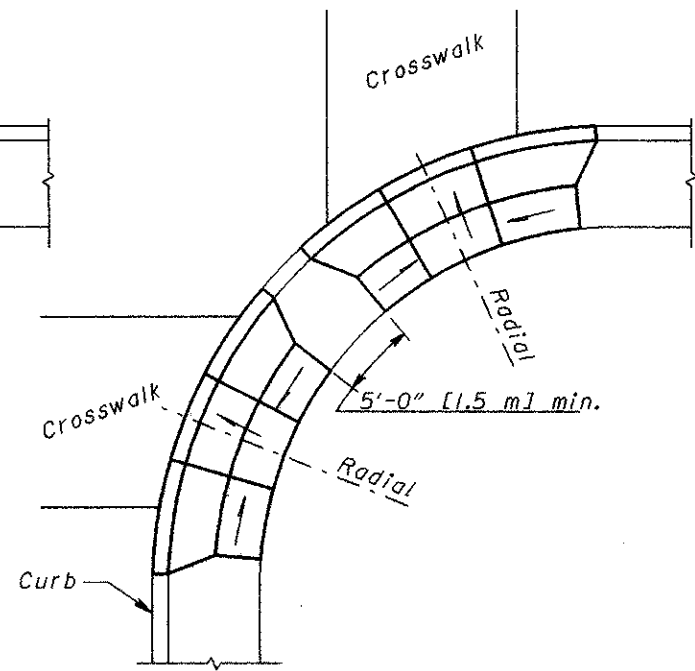
OHO DEPARTMENT OF TRANSPORTATION
 REVISIONS
 STDS. ENGR. M. EVANS
 ROADWAY ENGINEERING SERVICES
 DRAWN D. FOCKE
 ROADWAY DESIGN ENGINEER
 DATE 7-28-00
 STANDARD ROADWAY CONSTRUCTION DRAWING
CURB RAMPS
 NUMBER BP-7.1
 1/3



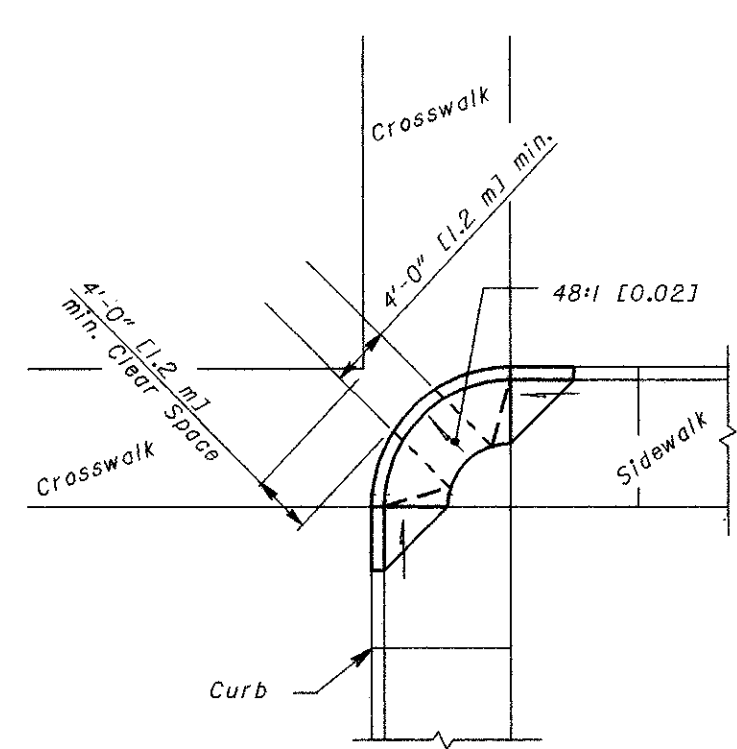
**DESIGN A
PERPENDICULAR RAMP**



**DESIGN B
PARALLEL RAMP**



**DESIGN C
COMBINATION RAMP**

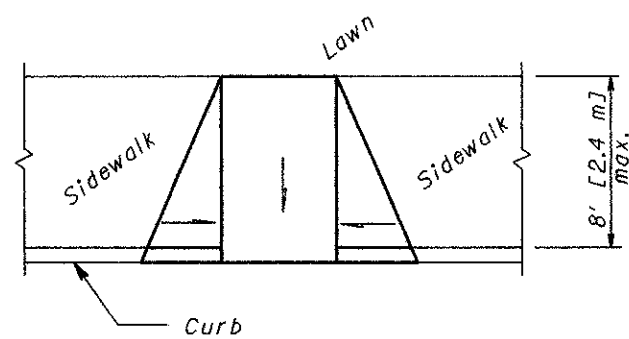


**DESIGN D
DIAGONAL RAMP**

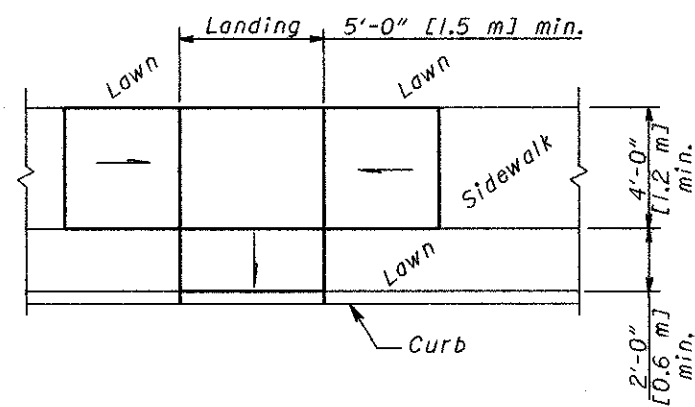
CORNER CURB RAMP DESIGNS

(See Curb Ramp Details on Sht. 1/3 for additional requirements.)

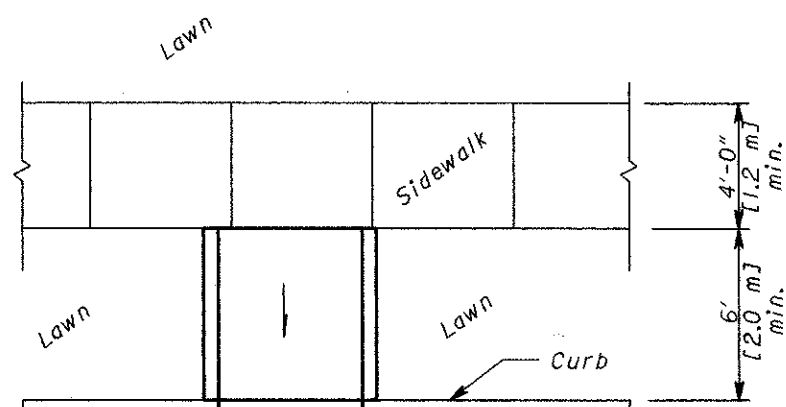
Use in existing walks only and when site constraints prohibit other designs. The diagonal ramp may be perpendicular, parallel or combination. Avoid using where curb radii are less than 20'-0" [6.0 m].



**DESIGN E
PERPENDICULAR RAMP**



**DESIGN F
PARALLEL RAMP**



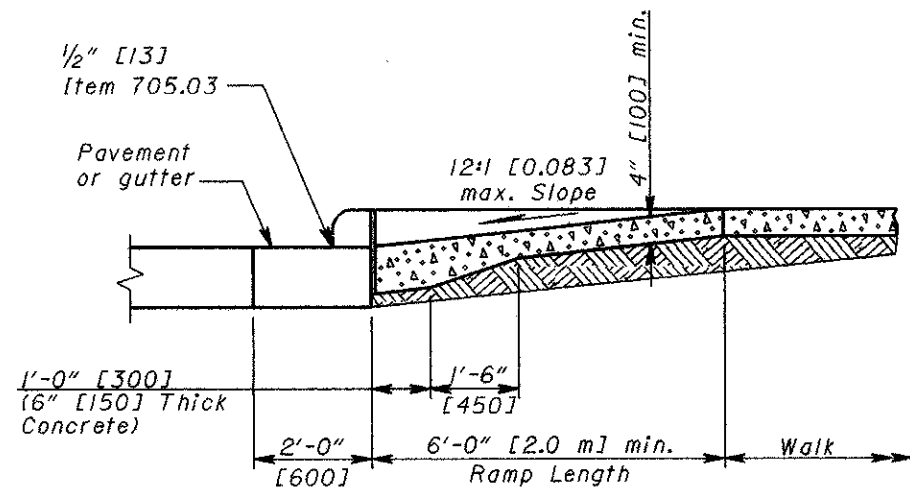
**DESIGN G
PERPENDICULAR RAMPS
w/o FLARES**

MID BLOCK CURB RAMP DESIGNS

(See Curb Ramp Details on Sht. 1/3 for additional requirements.)

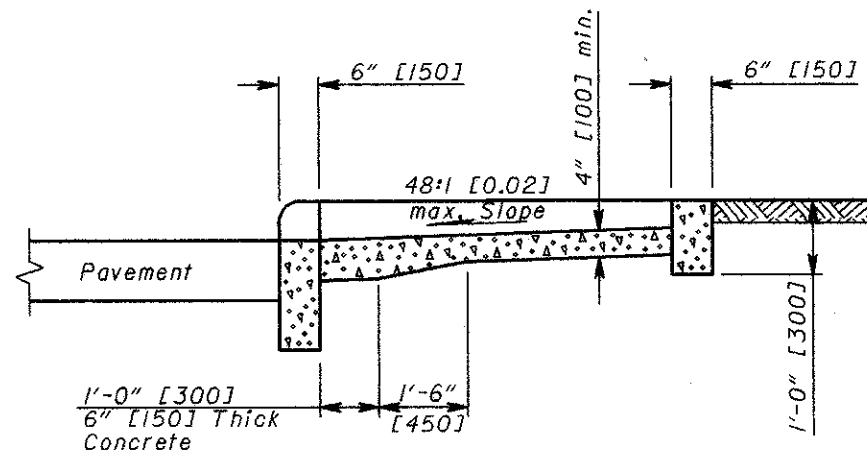
THIS DRAWING REPLACES BP-7.1M DATED 10-28-94.

NUMBER	BP-7.J	2 / 3
STANDARD ROADWAY CONSTRUCTION DRAWING	CURB RAMPS	
ROADWAY ENGINEERING SERVICES		
STDS. ENGR.	M. EVANS	
DRAWN	D. FOCKE	
REVISIONS		
OHIO DEPARTMENT OF TRANSPORTATION		
	ROADWAY DESIGN ENGINEER	
	DATE	



**SECTION A-A
NORMAL DETAIL**

See Sheet 1 of 3.
(Gutter shown)



SECTION B-B

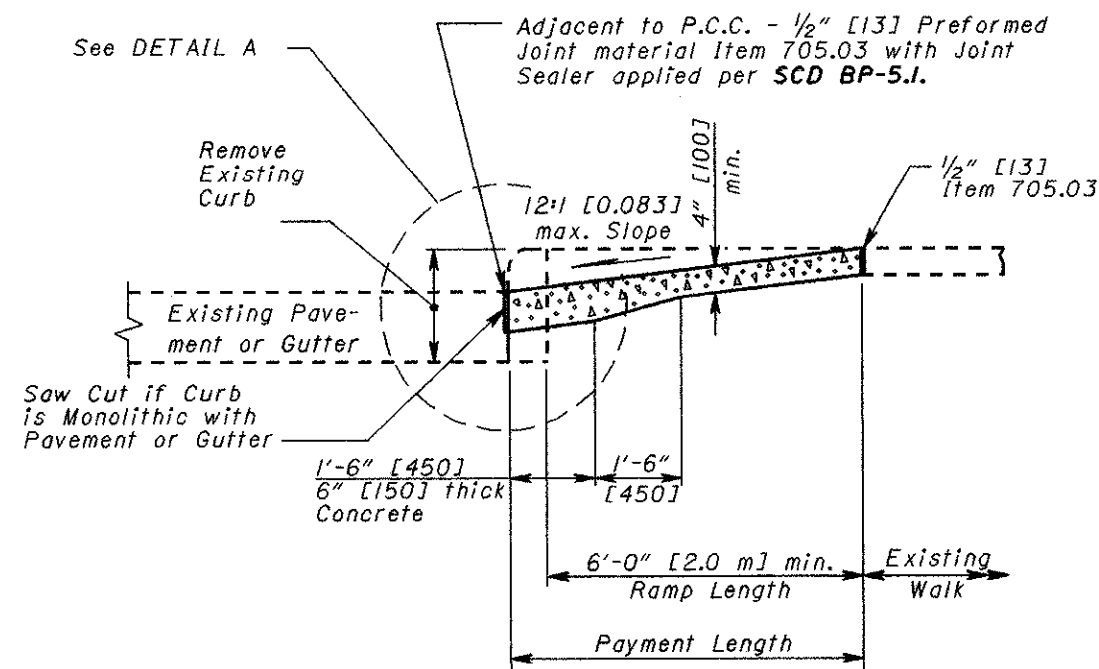
See Sheet 1 of 3.

NOTES

SURFACE TEXTURE: Texture shall be obtained by coarse brooming transverse to the ramp slopes and shall be rougher than adjacent walk.

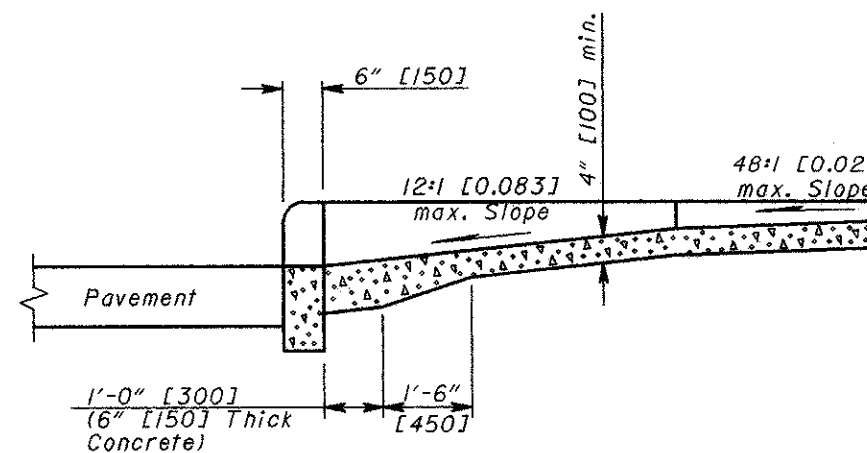
JOINTS: shall be provided in the curb ramp as extensions of walk joints and consistent with Item 608.03 requirements for a new concrete walk. A 1/2" [13] Item 705.03 expansion joint filler shall be provided around the edge of ramps built in existing concrete walk. Lines shown on this drawing indicate the ramp edge and slope changes and are not necessarily joint lines.

PAYMENT: Walk and curb, Items 608 and 609, shall be measured through the curb ramp area paid for under their respective Items. **Item 608 - Curb Ramp, Each**, constructed in new curb and walk shall include the cost of any additional materials, grading, forming and finishing. **Item 608 - Curb Ramp, Square Foot [Meter]**, constructed in existing curb and walk shall include the cost of furnishing all materials, grading, forming, and finishing of the curb and walk of the curb ramp. Removal of existing curb and walk shall be paid for under Item 202.



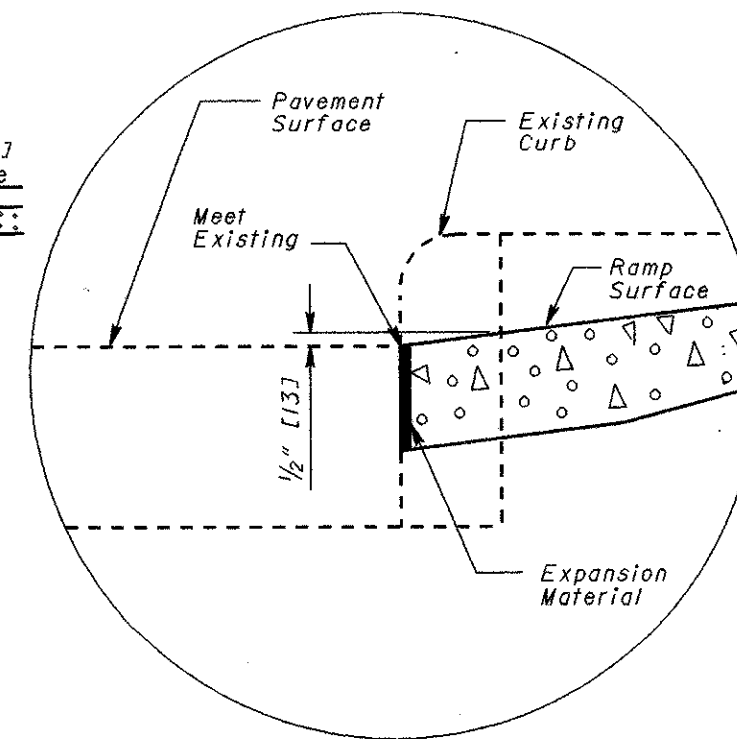
**SECTION A-A
EXISTING WALK DETAIL**

See Sheet 1 of 3.



SECTION C-C

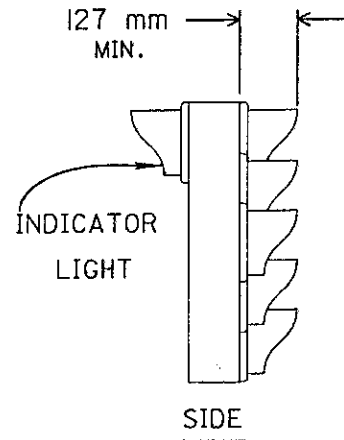
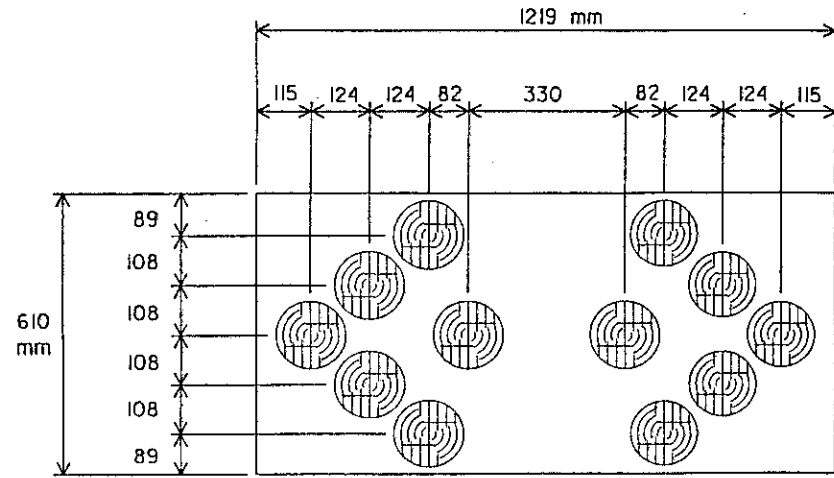
See Sheet 1 of 3.



DETAIL A

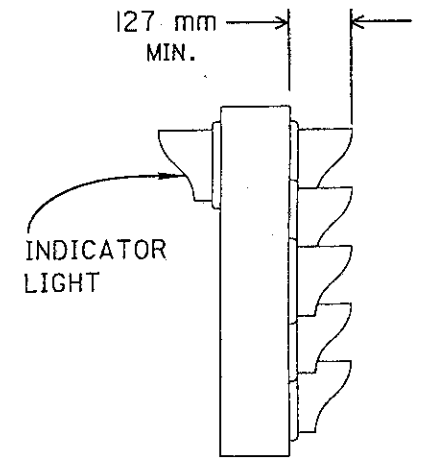
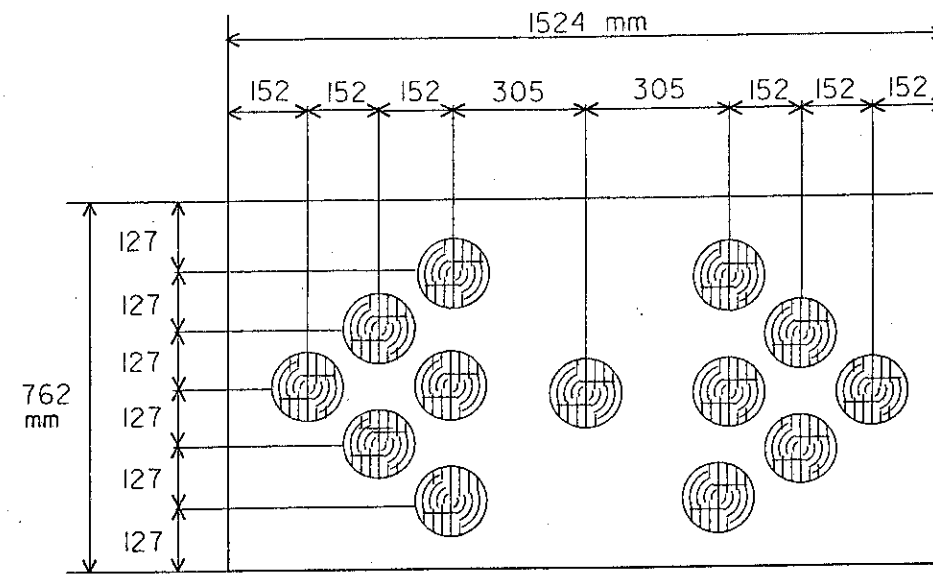
THIS DRAWING REPLACES BP-7.1M DATED 10-28-94.
 STANDARD ROADWAY CONSTRUCTION DRAWING
CURB RAMPS
 NUMBER **BP-7.1**
 3/3
 ROADWAY DESIGN ENGINEER
 DATE 7-28-00
 REVISIONS
 STOS. ENGR. M. EVANS
 DRAWN D. FOCKE
 OHIO DEPARTMENT OF TRANSPORTATION

ALL MEASUREMENTS ARE IN MILLIMETERS



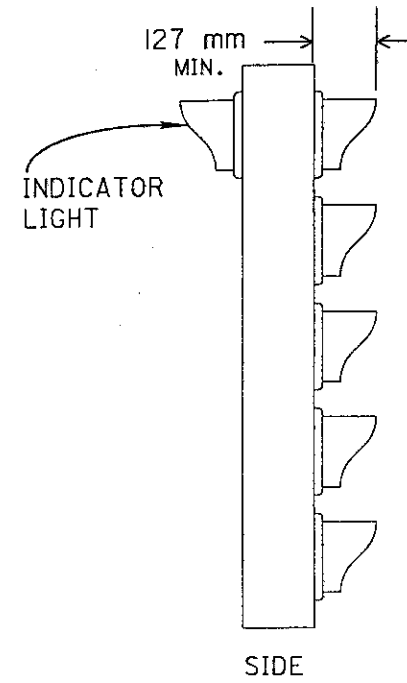
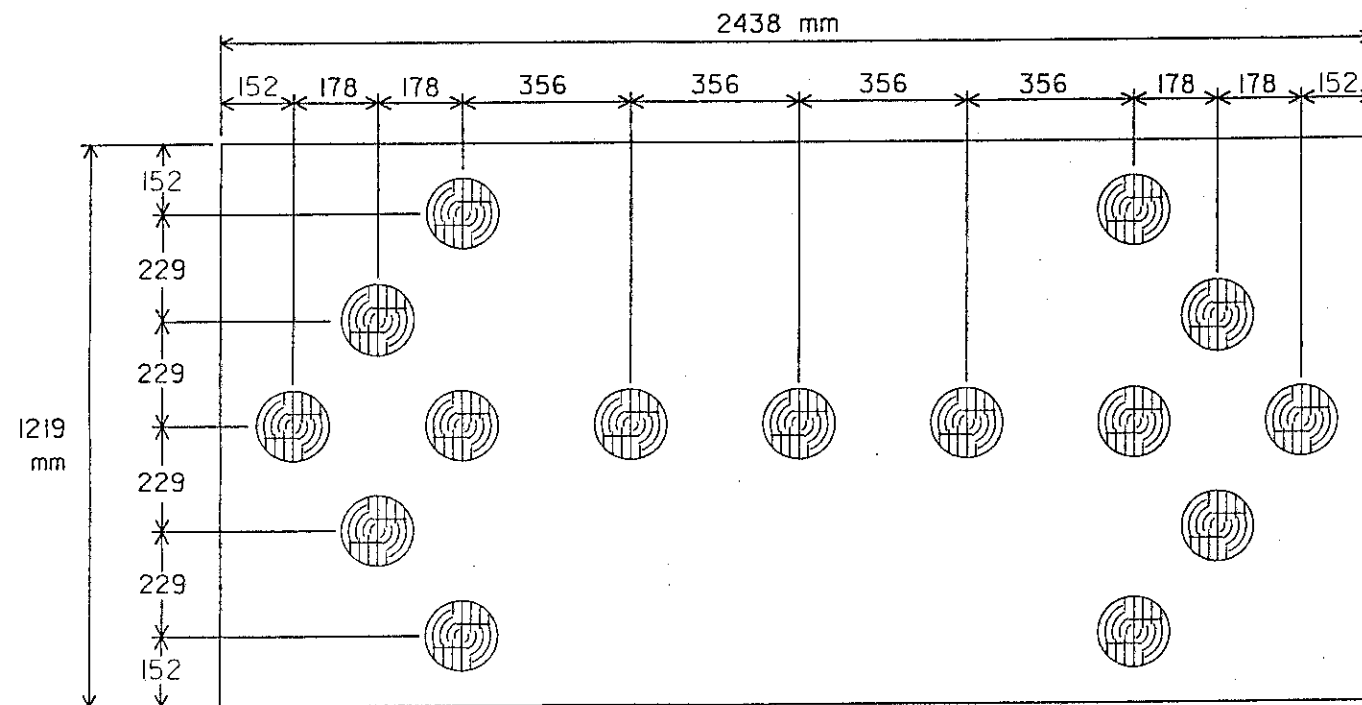
FRONT
TYPE A PANEL

ALL MEASUREMENTS ARE IN MILLIMETERS



FRONT
TYPE B PANEL

ALL MEASUREMENTS ARE IN MILLIMETERS



FRONT
TYPE C PANEL

M E T R I C

(SEE MT-35.11M FOR NOTES)

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 01/30/95
FLASHING ARROW PANEL	
STANDARD CONSTRUCTION DRAWING	MT-35.10M
APPROVED <i>[Signature]</i>	ENGR. OF DESIGN SERVICES

FLASHING ARROW PANEL

THE FLASHING ARROW PANEL SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. FLASHER PANEL
- B. LAMPS
- C. CONTROLS
- D. POWER SUPPLY
- E. MOUNTING

A. FLASHER PANEL

THE FLASHER PANEL SHALL BE OF EXTERIOR TYPE PLYWOOD BY CORROSION RESISTANT METAL CONSTRUCTION OF ADEQUATE DESIGN AND STRENGTH. THE PANEL FINISH SHALL BE FLAT BLACK.

A FLASHER PANEL SHALL BE ONE OF THREE SIZES. THE TYPE A PANEL SHALL BE A NOMINAL 610 MILLIMETERS HIGH BY 1219 MILLIMETERS WIDE. TYPE B SHALL BE A NOMINAL 762 MILLIMETERS HIGH BY 1524 MILLIMETERS WIDE. TYPE C SHALL BE A NOMINAL 1219 MILLIMETERS HIGH BY 2438 MILLIMETERS WIDE.

FLASHING ARROW PANELS, SHALL NORMALLY UTILIZE HIGH OUTPUT (4412A AND 4415A) LAMPS POWERED BY AN ENGINE DRIVEN GENERATOR WHEN PERMITTED BY THE PLANS. THE CONTRACTOR MAY ALSO FURNISH UNITS POWERED BY A SOLAR ARRAY AND BATTERIES OR ONLY BATTERIES; HOWEVER THESE UNITS SHALL NOT BE USED WHERE THE APPROACHING TRAFFIC WOULD BE ON A HORIZONTAL CURVE IN EXCESS OF 3 DEGREES. THESE UNITS SHALL NOT BE USED IF THE APPROACHING TRAFFIC, CLOSER THAN 1.6 km (.8 km WHERE SPEED LIMITS ARE LESS THAN 64 km/h), IS MORE THAN 5 1/2 DEGREES HORIZONTALLY OR 2 DEGREES VERTICALLY FROM THE CENTRAL AXIS OF THE LENSE UNITS.

B. LAMPS

FOR ENGINE POWERED GENERATOR UNITS, LAMPS SHALL BE ANSI NUMBER 4412A (PAR 46) FOR TYPE B AND C AND 4415A (PAR 36) FOR TYPE A. THE LAMP SHALL BE FITTED WITH AN UPPER HOOD OF NOT LESS THAN 180° AT LEAST 127 MILLIMETERS LONG. ARROW PANELS MAY USE A LOWER POWER (WATTAGE) LAMP THAN THE STANDARD ARROW PANELS. THE LAMPS SHALL BE APPROXIMATELY 127 MILLIMETER DIAMETER WITH A PARABOLIC REFLECTOR. THE LAMP SHALL PROVIDE IMPROVED LIGHT DISTRIBUTION CONTROL BY MEANS OF HIGH QUALITY REFLECTORS AND REFRACTORS. THE LIGHT OUTPUT FROM EACH LAMP OF THE ARROW SHALL NOT BE LESS THAN SHOWN IN FIGURE I WHEN OPERATING AT FULL DAYTIME BRIGHTNESS:

THE LAMPS SHALL BE SECURELY MOUNTED AND POSITIONED IN THE PANEL PERPENDICULAR TO THE PANEL FACE AND ORIENTED SO THAT THE LAMP LOCATION LUG (ON BACK OF THE LAMP) IS ON THE HORIZONTAL CENTER LINE THROUGH THE LENS. THE LUG WILL BE ON THE RIGHT SIDE OF THE LAMP AS VIEWED FROM THE FRONT.

THE LAMPS SHALL BE WIRED IN CIRCUITS THAT CAN BE SWITCHED TO DISPLAY ANY ONE OF THE FOLOWING MESSAGES: LEFT ARROW, RIGHT ARROW, LEFT AND RIGHT, AND CAUTION BAR. A MINIMUM OF THREE INDICATOR LIGHTS SHALL BE PLACED ON THE BACK OF THE PANEL TO INDICATE WHICH MESSAGE MODE IS IN OPERATION.

EACH PANEL SHALL CONTAIN THE FOLLOWING NUMBER OF LAMPS AS A MINIMUM: TYPE A-12 LAMPS, TYPE B-13 LAMPS, TYPE C-15 LAMPS.

LUX POWER CHART

		215	215	215			4°		
108	1076	1614	2152	1614	1076	108	2°		
215	2152	4304	5380	4304	2152	215	0°	HORIZONTAL	
108	1076	1614	2152	1614	1076	108	- 2°		
		215	215	215			- 4°		
7.5°	5°	2.5°	0°	2.5°	5°	7.5°			
LEFT		CENTER				RIGHT			

FIGURE I

- (1) MEASUREMENTS EXPRESSED IN LUX.
- (2) COLOR OF OUTPUT LIGHT SHALL BE YELLOW TO LIGHT YELLOW.

C. CONTROLS

EACH FLASHING ARROW PANEL SHALL CONTAIN A FLASHER CONTROL AND A DIMMER CONTROL UNIT HOUSED IN A CABINET WHICH CAN BE LOCKED.

1. FLASHER CONTROL

THE FLASH RATE FOR THE SIGN PANEL SHALL BE 25 TO 40 FLASHES PER MINUTE. THE FLASHER SHALL NOT CAUSE ELECTROMAGNETIC INTERFERENCE. THE LAMPS SHALL HAVE A MINIMUM "ON TIME" OF 50% AND A MAXIMUM OF 66%.

2. DIMMER CONTROL

LAMP INTENSITY SHALL BE VARIABLE BY MEANS OF A PHOTOELECTRICALLY CONTROLLED CIRCUIT WHICH SHALL REDUCE LAMP OUTPUT DURING LOW AMBIENT LIGHT CONDITIONS. THE PHOTOELECTRIC CONTROL SHALL BE CALIBRATED TO ACTUATE A LAMP DIMMING CIRCUIT AT 22 TO 54 AMBIENT LUX AND TO RESTORE THE LIGHTS TO NORMAL AT 54 TO 108 AMBIENT LUX. A TIME DELAY SHALL BE BUILT INTO THE CONTROL TO PREVENT FALSE OPERATION DUE TO LIGHT FLASHES. THE PHOTOELECTRIC CONTROL SHALL CONTAIN A SWITCH WHICH SHALL OVERRIDE THE PHOTOELECTRIC CONTROL. THE DIMMING CIRCUIT SHALL BE EXTERNALLY ADJUSTABLE SUCH THAT THE LIGHT OUTPUT MAY BE ADJUSTED WITHIN THE RANGE OF 50% TO 100% OF THE NORMAL LAMP OUTPUT. IT SHALL NORMALLY BE SET AT 50% UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

D. POWER SUPPLY

THE FLASHING ARROW PANEL SHALL OPERATE FROM POWER SOURCES CAPABLE OF CONTINUOUSLY FURNISHING THE PROPER VOLTAGE TO THE LAMPS A MINIMUM OF 24 HOURS WITHOUT ATTENDANCE.

D. CONT.

MOTOR GENERATORS, IF USED SHALL BE OF MODERN DESIGN TO PROVIDE LOW EMISSION OF POLLUTANTS AND SHALL BE PROPERLY MUFFLED. THE MOTOR GENERATOR SHALL BE ENCLOSED IN A MESH ENCLOSURE WHICH CAN BE LOCKED. THE FUEL TANK SHALL HAVE A CAP WHICH CAN BE LOCKED. MOTOR GENERATORS SUPPLYING POWER TO A FLASHING ARROW SIGN SHALL NOT BE USED TO SUPPLY POWER TO OTHER EQUIPMENT. GASOLINE FUELED ENGINES SHALL NOT BE USED.

BATTERY AND SOLAR/BATTERY UNITS SHALL HAVE A NO-CHARGE-LIFE OF NOT LESS THAN 15 DAYS. NO-CHARGE-LIFE IS THE NUMBER OF CONSECUTIVE DAYS THAT THE SYSTEM CAN CONTINUE TO FUNCTION (DOUBLE ARROW MODE, NORMAL DIMMING DURING 12 HOUR NIGHT, FULL OUTPUT DURING 12 HOUR DAY) STARTING WITH A FULL BATTERY CHARGE AND WITH NO ADDITIONAL CHARGE BEING PROVIDED BY THE SOLAR CELLS. THE NO-CHARGE-LIFE MAY BE BASED UPON CALCULATIONS PROVIDING THAT MANUFACTURER'S RATINGS AND EFFICIENCY CALCULATIONS ARE FURNISHED FOR EACH MAJOR COMPONENT.

E. MOUNTING

THE FLASHING ARROW PANEL MAY BE TRAILER OR VEHICLE MOUNTED OR MOUNTED ON A RIGID SUPPORTING DEVICE SUITABLE FOR MAINTAINING IT IN THE DESIGNATED POSITION. EACH OF THE MOUNTING METHODS SHALL BE SUITABLY STABLE SUCH AS TO PREVENT MOVEMENT DUE TO HIGH WINDS OR PASSAGE OF LARGE VEHICLES.

WHEN A TRAILER IS USED, CONSTRUCTION SHALL BE SUCH AS TO TRANSPORT THE FLASHING ARROW PANEL AND APPURTANCES ADEQUATELY AND LEGALLY AS WELL AS SUPPORT THEM PROPERLY DURING OPERATION. THE TRAILER SHALL BE EQUIPPED WITH DEVICES WHICH SHALL PROVIDE LEVELING AND STABILITY DURING OPERATION.

MINIMUM ARROW PANEL MOUNTING HEIGHT SHALL BE 2.1m ABOVE THE PAVEMENT SURFACE (MEASURED TO THE BOTTOM OF THE PANEL).

USE AND OPERATION

THE FLASHING ARROW PANEL SHALL BE LOCATED AS SHOWN IN THE MAINTAINENCE OF TEAFFIC DRAWINGS OR AS DIRECTED BY THE ENGINEER AND OPERATED CONTINUOUSLY DURING TRAFFIC MAINTAINED PERIODS. THE CONTRACTOR SHALL SUPPLY ALL FUEL, LUBRICANTS AND PARTS NECESSARY TO OBTAIN CONTINUOUS OPERATION AND SHALL PROVIDE ALL SERVICE. THE CONTRACTOR SHALL INSPECT THE OPERATION OF THE UNIT DAILY, INCLUDING WEEKENDS AND HOLIDAYS. THE CONTRACTOR SHALL ARRANGE WITH THE ENGINEER, AN ACCEPTABLE METHOD OF OBTAINING SERVICE FOR A MALFUNCTIONING PANEL WITHIN 30 MINUTES OF A REPORTED MALFUNCTION. LAMP INTENSITY SHALL BE ADJUSTED TO PROVIDE MINIMUM LEGIBILITY DISTANCES OF .8 km (TYPE A), 1.21 km (TYPE B) AND 1.6 km (TYPE C).

TYPE C PANELS SHALL BE USED FOR STATIONARY OPERATIONS ON HIGH SPEED (88 km/h OR GREATER), HIGH VOLUME ROADWAYS. TYPE B SHALL BE USED FOR STATIONARY OPERATIONS ON INTERMEDIATE SPEED (64-80 km/h) FACILITIES, AND TYPE A ON LOW SPEED (32-56 km/h) FACILITIES.

IN ADDITION, TYPE B PANELS SHALL BE USD FOR MOVING OPERATIONS ON FREEWAYS AND EXPRESSWAYS AND TYPE A FOR MOVING OPERATIONS ON OTHER FACILITIES.

BATTERY AND SOLAR/BATTERY UNITS SHALL BE FULLY CHARGED WHEN FIRST SET UP. THEY SHALL HAVE GAUGES TO INDICATE APPROXIMATE BATTERY CHARGE REMAINING. THE CONTRACTOR SHALL VERIFY DAILY THAT THE UNIT IS OPERATING SATISFACTORILY AND THE REMAINING BATTERY CHARGE IS SUFFICIENT FOR AT LEAST 2 MORE DAYS.

FLASHING ARROW PANELS ARE NOT TO BE USED ON TWO LANE-TWO WAY ROADWAYS.

WHEN LEFT UNATTENDED THE CONTROL CABINET, MOTOR GENERATOR ENCLOSURE AND FUEL TANK SHALL BE LOCKED.

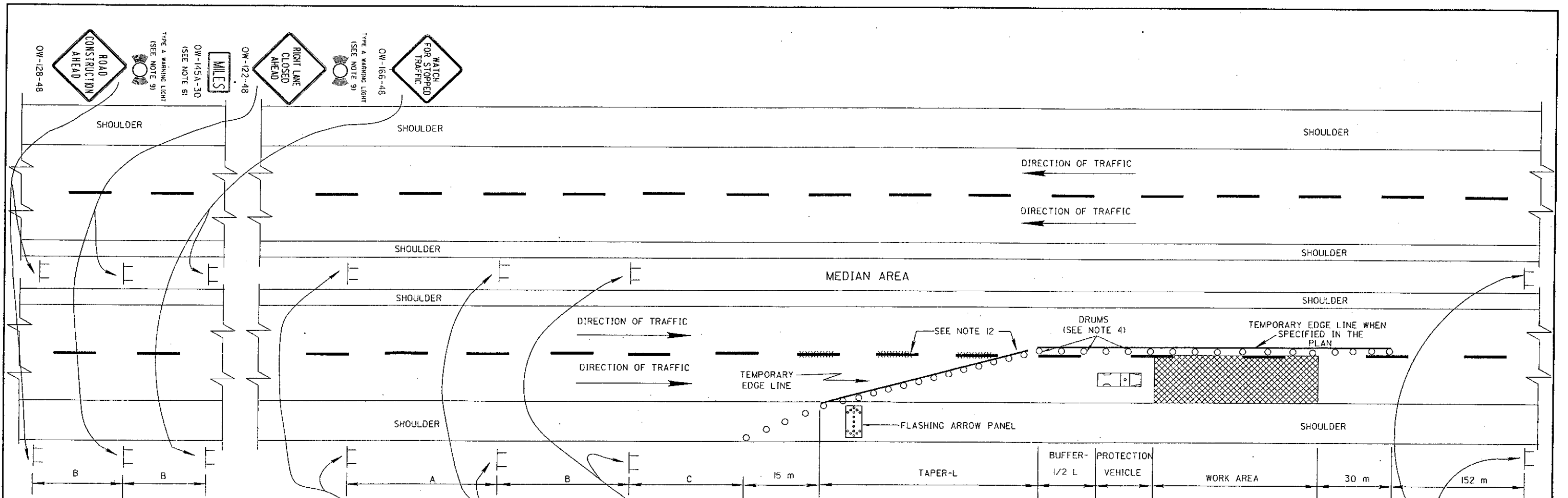
TYPE A AND TYPE B PANELS USED IN MOVING OPERATIONS MAY BE POWERED BY THE VEHICLE'S ELECTRICAL SYSTEM BUT SHALL NOT BE LEFT UNATTENDED WHEN SO POWERED.

WHEN NOT IN USE, THE FLASHING ARROW PANEL SHALL BE STORED AT A LOCATION WHICH WILL NOT BE HAZARDOUS TO TRAFFIC OR PEDESTRIANS.

THE PANELS SHALL BE DESIGNED FOR OPERATION IN 100% HUMIDITY AND TEMPERATURES FROM -29 TO + 54 DEGREES CELCIUS.

M E T R I C

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 01/30/95
FLASHING ARROW PANEL NOTES	
STANDARD CONSTRUCTION DRAWING	MT-35.IIM
APPROVED <i>[Signature]</i>	ENGR. OF DESIGN SERVICES



GENERAL NOTES:

1. THE LOCATION OF THE MERGING TAPER AND THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.
2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61m CLEARANCE TO EXISTING SIGNS.
3. THE TAPER LENGTH (L) AND SPACING (S) OF DRUMS SHALL CONFORM TO TABLE II. DRUM SPACING (S) SHALL BE USED FOR THE MERGING TAPER, THE BUFFER AREA AND FOR THE FIRST 305 m OF THE WORK AREA AND AT OTHER HAZARDOUS LOCATIONS AS DIRECTED BY THE ENGINEER. THE MAXIMUM DRUM SPACING FOR THE BALANCE OF THE WORK AREA IS TO BE TWO TIMES THE SPACING (S) IN TABLE II. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER.
4. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.
5. THE ADVISORY SPEED SIGN OW-143 SHALL BE USED WHEN SPECIFIED IN THE PLAN.
6. THE DISTANCE PLATE OW-145A SHALL INDICATE THE DISTANCE TO THE BEGINNING OF THE MERGING TAPER (L). DISTANCES LESS THAN ONE MILE MAY BE EXPRESSED IN FEET. THE PLAQUE MAY BE OMITTED IF EXTRA ADVANCE SIGN GROUPS ARE NOT USED.
7. THE PROTECTION VEHICLE, LOCATED CLOSE TO THE WORK, SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.
8. THE FLASHING ARROW PANEL SHALL MEET REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING TC-35.10M.
9. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE OW-128 AND OW-122 (123) SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY
10. WHEN WORK IS BEING PERFORMED IN THE LANE ADJACENT TO THE MEDIAN ON A DIVIDED HIGHWAY, OW-123 SIGNS SHALL BE SUBSTITUTED FOR THE OW-122 SIGNS AND OW-60D SIGNS SHALL BE SUBSTITUTED FOR THE OW-60C SIGNS.
11. 36 INCH WARNING SIGN SIZES MAY BE USED ON DIVIDED ROADWAYS THAT ARE NOT CLASSIFIED AS FREEWAYS OR EXPRESSWAYS.
12. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS

TABLE I

MINIMUM DISTANCE (METERS)	A	B	C
MAJOR STANDARD	152	152	152
URBAN FREEWAY & EXPRESSWAY	152 TO 305	152 TO 305	152 TO 305
RURAL FREEWAY & EXPRESSWAY	792	488	305

TABLE II

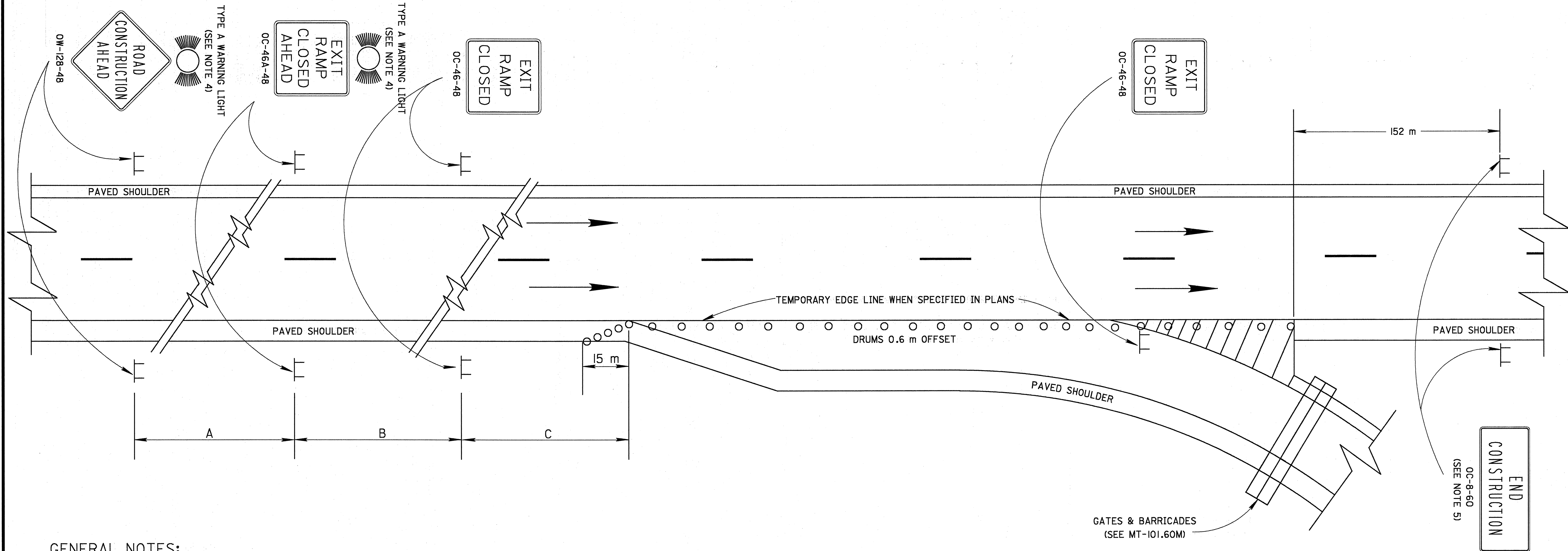
NORMAL SPEED LIMIT (MPH)	MINIMUM TAPER (L) (METERS)	MAXIMUM SPACING (S) OF DRUMS
30-40	98	12
45-55	201	12
60-65	238	18

METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 04/25/94
CLOSING RIGHT OR LEFT LANE OF A MULTI-LANE DIVIDED HIGHWAY WITH DRUMS	
STANDARD CONSTRUCTION DRAWING	MT-95.30M
APPROVED: <i>[Signature]</i> ENGR. OF DESIGN SERVICES	

12. THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.
13. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.
14. OW-128 SIGNS SHALL BE PROVIDED ON ENTRANCE RAMP AND/OR SIDE ROADS LOCATED WITHIN THE WORK LIMITS OR THE ADVANCE WARNING SIGN GROUP. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND DRIVEWAYS. THREE DRUMS SHALL BE PLACED ON EACH SIDE ACROSS THE CLOSED LANE AT EACH INTERSECTION AND DRIVEWAY.
15. EXTRA ADVANCE WARNING SIGN GROUPS CONSISTING OF OW-128, OW-122 AND OW-166 SIGNS PLUS DISTANCE PLATES MAY BE SPECIFIED IN THE PLANS OR REQUIRED TO BE ERRECTED AT THE DIRECTION OF THE ENGINEER.
16. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.



GENERAL NOTES:

1. THE LOCATION OF THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.
2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61 m CLEARANCE TO EXISTING SIGNS.
3. ALONG THE CLOSURE, DRUMS SHALL BE SPACED AT 6.1 m CENTER TO CENTER. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.
4. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE OW-128 AND OC-46A SIGNS ARE REQUIRED WHENEVER A NIGHT CLOSURE IS NECESSARY.
5. THE OC-8 SIGNS ARE ONLY REQUIRED FOR RAMP CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

TABLE I

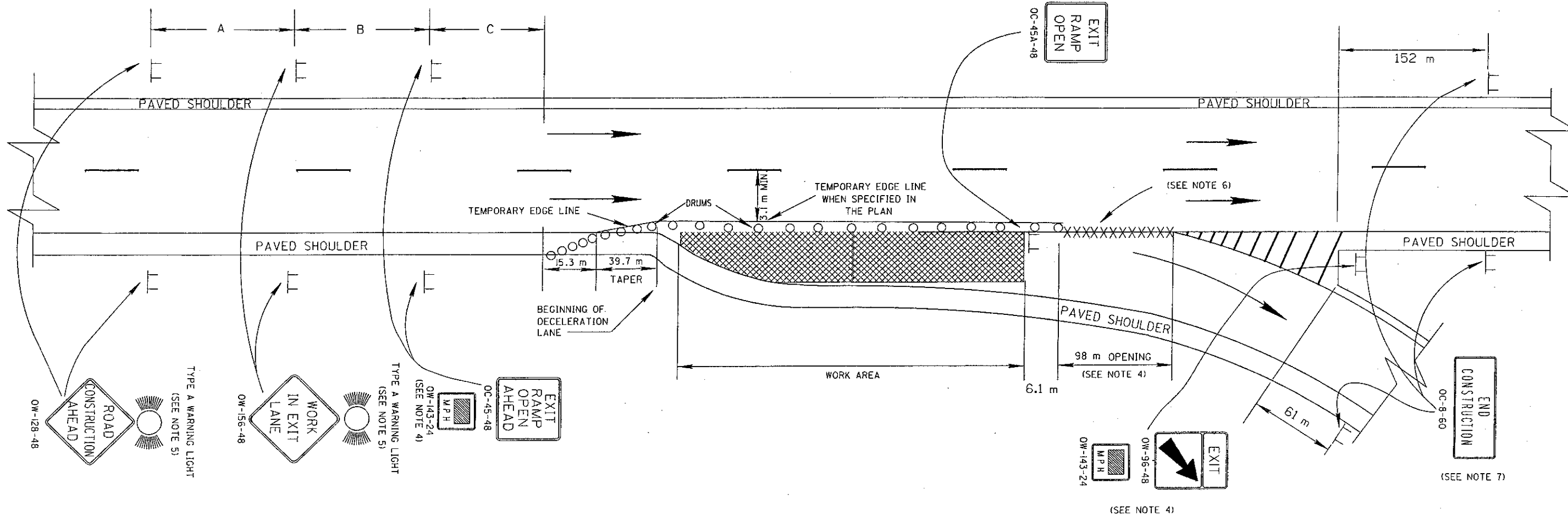
MINIMUM DISTANCE (METERS)			
	A	B	C
URBAN	152	152	152
FREEWAY & EXPRESSWAY	TO	TO	TO
RURAL	305	305	305
FREEWAY & EXPRESSWAY	792	488	305

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.



**metric
units**

OFFICE OF TRAFFIC ENGINEERING DIVISION OF ENGINEERING POLICY OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 03/01/96
EXIT RAMP CLOSURE	
STANDARD CONSTRUCTION DRAWING	MT-98.19M
APPROVED <i>Raymond</i>	ADMINISTRATOR



GENERAL NOTES:

1. THE LOCATION OF THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.
2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61 m CLEARANCE TO EXISTING SIGNS, EXCEPT THE OW-96-48 SIGN WHICH MAY BE ADJACENT TO THE CF SIGN IN THE GORE.
3. ALONG THE CLOSURE DRUMS SHALL BE SPACED AT 6.1 m CENTER TO CENTER. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.
4. THE OPENING TO THE RAMP SHALL BE 98 m OR MORE, WHENEVER POSSIBLE. A LESSER OPENING MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. WHEN A LESSER OPENING IS PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
35 m	56 km/h - 35 MPH

IF A 61 m OPENING CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

4. THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

5. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" AND "WORK IN EXIT LANE" SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
6. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMs) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.
7. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.
8. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

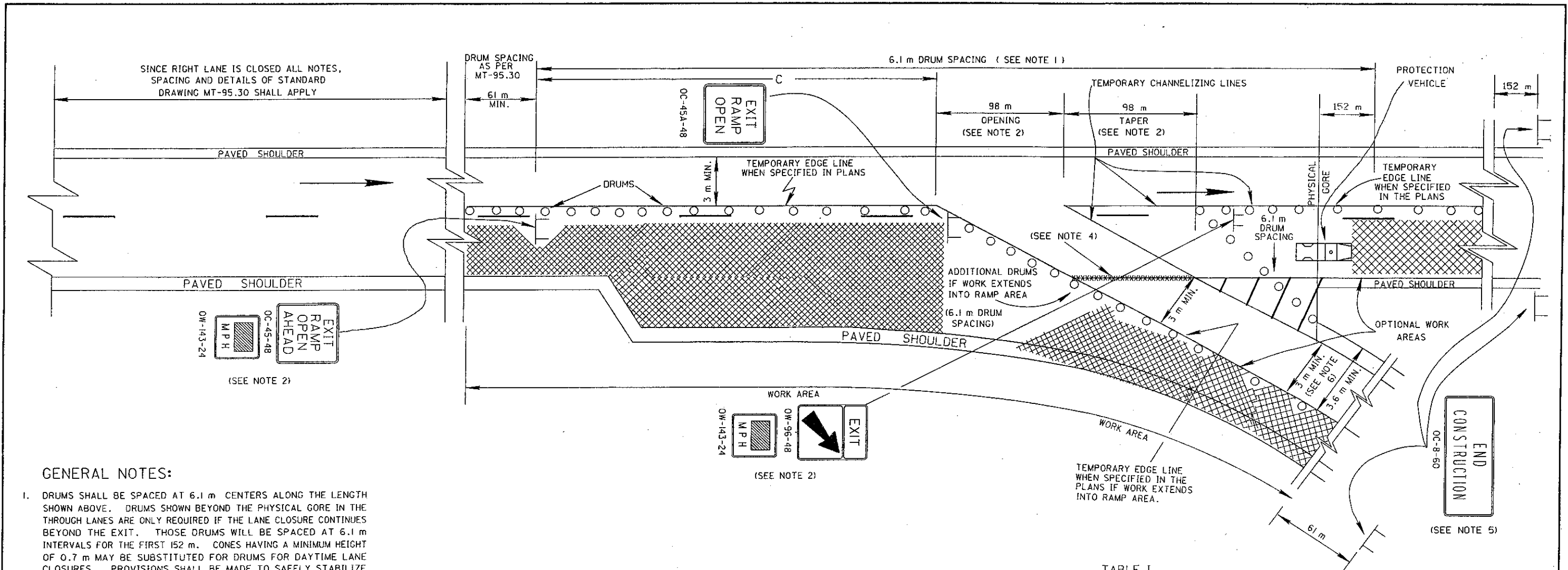
TABLE I

	MINIMUM DISTANCE (METERS)		
	A	B	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305	152 TO 305	152 TO 305
RURAL FREEWAY & EXPRESSWAY	792	488	305

METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF ODOT. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 06/24/93
LANE CLOSURE IN DECELERATION LANE	
STANDARD CONSTRUCTION DRAWING	MT-98.12M
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	



GENERAL NOTES:

1. DRUMS SHALL BE SPACED AT 6.1 m CENTERS ALONG THE LENGTH SHOWN ABOVE. DRUMS SHOWN BEYOND THE PHYSICAL GORE IN THE THROUGH LANES ARE ONLY REQUIRED IF THE LANE CLOSURE CONTINUES BEYOND THE EXIT. THOSE DRUMS WILL BE SPACED AT 6.1 m INTERVALS FOR THE FIRST 152 m. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

2. THE OPENING TO THE RAMP AND THE TAPER ACROSS THE CLOSED LANE SHOULD EACH BE 98 m OR MORE WHENEVER POSSIBLE. A LESSER OPENING AND/OR TAPER MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. THE OPENING SHALL NEVER BE LESS THAN THE TAPER, BUT MAY BE MORE. WHEN LESSER OPENING AND/OR TAPER LENGTHS ARE PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING/TAPER	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
61 m	56 km/h - 35 MPH

IF 61 m MINIMUM DIMENSIONS CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16.1 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

3. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

4. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND a) TEMPORARY CHANNELIZING LINES SHALL BE APPLIED AND b) THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY CHANNELIZING LINES AND EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

5. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

6. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD.

7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

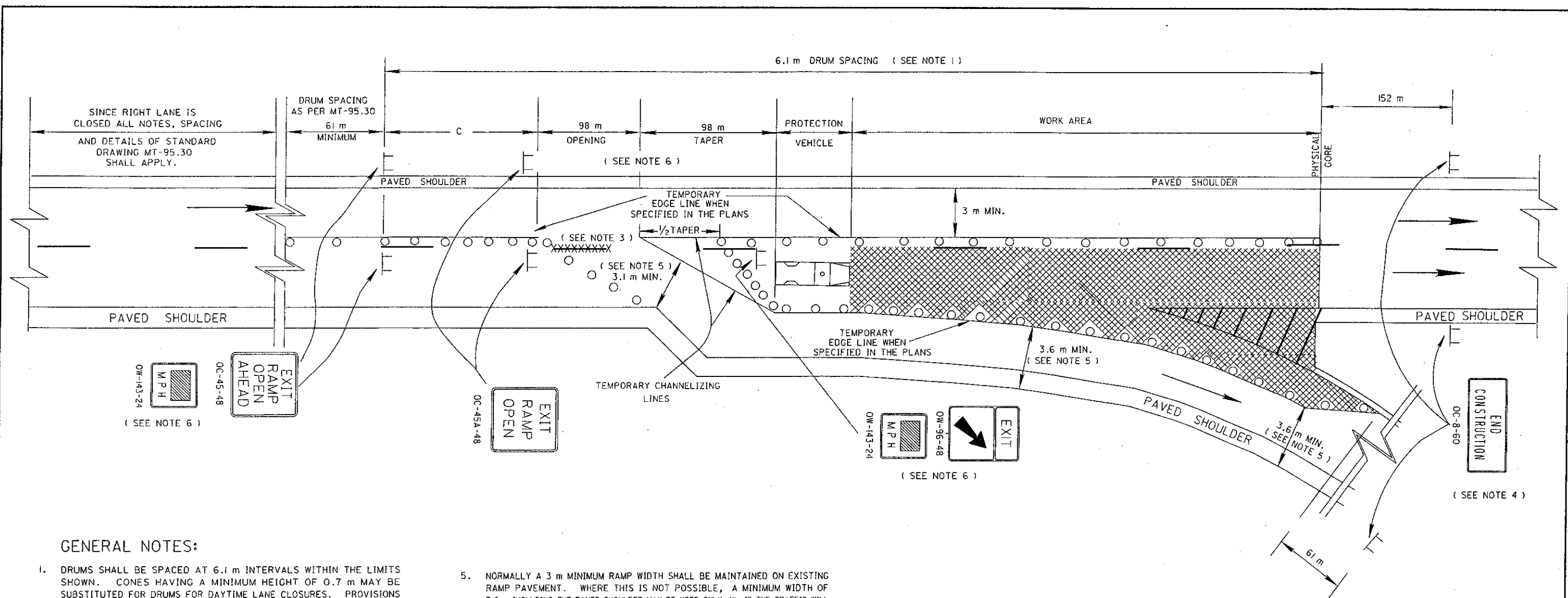
TABLE I
MINIMUM DISTANCE (METERS)

	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305
RURAL FREEWAY & EXPRESSWAY	305

METRIC

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 06/24/93
LANE CLOSURE BEFORE EXIT GORE	
STANDARD CONSTRUCTION DRAWING	MT-98.13M
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	



GENERAL NOTES:

- DRUMS SHALL BE SPACED AT 6.1 m INTERVALS WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.
- THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.
- IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMs) SHALL BE REMOVED AND a) TEMPORARY CHANNELIZING LINES SHALL BE APPLIED AND b) THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY CHANNELIZING LINES AND EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.
- THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

- NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD.
- THE OPENING TO THE RAMP AND THE TAPER IN ADVANCE OF THE CLOSED LANE SHOULD EACH BE 98 m OR MORE WHENEVER POSSIBLE. A LESSER OPENING AND/OR TAPER LENGTH MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. THE OPENING SHALL NEVER BE LESS THAN THE TAPER, BUT MAY BE MORE. WHEN LESSER OPENING AND/OR TAPER LENGTHS ARE PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING/TAPER	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
61 m	56 km/h - 35 MPH

IF 61 m MINIMUM DIMENSION CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16.1 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

- ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

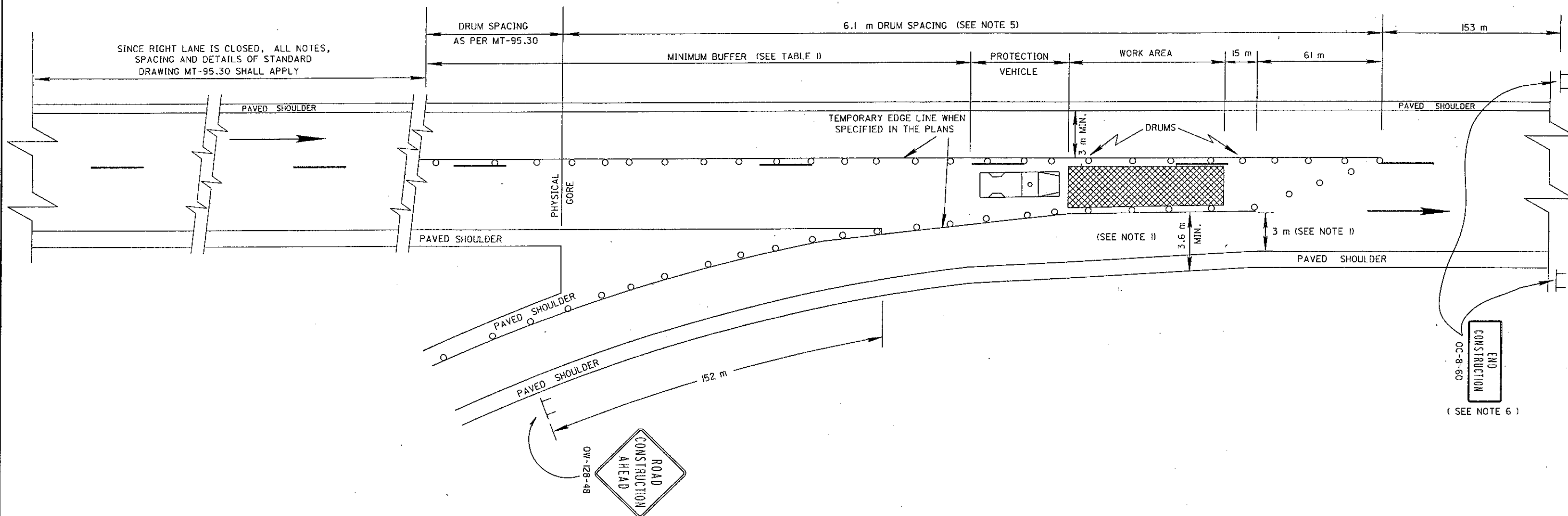
TABLE I

	MINIMUM DISTANCE (METERS)
	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305
RURAL FREEWAY & EXPRESSWAY	305

M E T R I C

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 06/24/93
LANE CLOSURE AT EXIT GORE	
STANDARD CONSTRUCTION DRAWING	MT-98.14M
APPROVED: <i>[Signature]</i> ENGR. OF DESIGN SERVICES	



GENERAL NOTES:

1. THIS WORK AREA TRAFFIC CONTROL APPLICATION SHALL BE EMPLOYED ONLY WHEN THE LATERAL CLEARANCE BETWEEN THE CHANNELIZING DEVICES AT THE RIGHT EDGE OF THE WORK AREA AND THE EDGE OF THE RAMP PAVEMENT IS 3 m OR MORE. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD. WHEN THE RAMP IS CLOSED APPROPRIATE DETOUR SIGNS SHALL BE PROVIDED.
2. WHEN THE RAMP IS NOT LONG ENOUGH TO ALLOW SIGN PLACEMENT AS SPECIFIED ABOVE, THEY MAY BE SPACED PROPORTIONATELY WITHIN THE SPACE AVAILABLE AS DETERMINED BY THE ENGINEER (A 61 m MINIMUM SPACING MUST BE MAINTAINED).
3. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.
4. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMs) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.
5. DRUMS SHALL BE SPACED AT 6.1 m INTERVALS ON BOTH SIDES OF THE WORK AREA WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.
6. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.
7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

NORMAL SPEED LIMIT		MINIMUM BUFFER
(MPH)	(km/h)	(METERS)
45 - 50	72 - 88	101
60 - 65	96 - 104	119

M E T R I C

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
MAINTENANCE OF TRAFFIC	DATE 06/24/93
LANE CLOSURE AT ENTRANCE RAMP: PLAN A	
STANDARD CONSTRUCTION DRAWING	MT-98.15M
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	

GENERAL

IN ADDITION TO 614, TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE PURPOSE OF THE FOLLOWING REQUIREMENTS FOR TRAFFIC CONTROL FOR PAVEMENT MARKING OPERATIONS IS TO PROVIDE SAFETY FOR HIGHWAY USERS, WORKERS AND EQUIPMENT AND TO PROTECT THE MARKINGS FROM DAMAGE DURING APPLICATION. THESE REQUIREMENTS ARE THE REQUIRED MINIMUMS. IF AT ANY TIME DURING THE APPLICATION OF MARKINGS IT IS FOUND BY THE ENGINEER THAT THESE MINIMUM TRAFFIC CONTROL REQUIREMENTS ARE NOT ACHIEVING THE NECESSARY SAFETY AND MARKING PROTECTION. ADDITIONAL TRAFFIC CONTROL SHALL BE IMPLEMENTED AT NO ADDITIONAL COST.

THE ENGINEER MAY SUSPEND WORK IN ORDER TO RELIEVE TRAFFIC CONGESTION AT ANY TIME. NO WORK SHALL BE DONE DURING PEAK HOURS, AS DETERMINED BY THE ENGINEER.

VEHICLES TRANSPORTING FLAMMABLE PAVEMENT MARKING MATERIALS (MATERIAL SUPPLY VEHICLES) SHALL NOT BE UTILIZED FOR LEAD OR TRAIL VEHICLES OR FOR POWER BROOM EQUIPMENT. ALL PAVEMENT MARKING APPLICATION, PROTECTION AND SUPPORT EQUIPMENT FOLLOWING THE LINE MARKING MACHINE SHALL HAVE THE TRAFFIC CONTROL EQUIPMENT OF A TRAIL VEHICLE.

LINE MARKING MACHINES SHALL NOT BE USED FOR SIGN AND CONE PLACEMENT.

LEAD VEHICLE

A LEAD VEHICLE IS TO BE USED TO WARN OPPOSING TRAFFIC OF THE APPROACH OF CENTER LINE AND OTHER MARKING EQUIPMENT WHEN THIS EQUIPMENT EXTENDS INTO THE ADJACENT OPPOSING TRAFFIC LANE. THE LEAD VEHICLE SHALL PRECEDE THE "LEFT OF CENTER" MARKING EQUIPMENT A DISTANCE THAT WILL PROVIDE ADVANCE SAFE WARNING TO APPROACHING TRAFFIC. THE OPERATOR OF THIS UNIT SHALL DRIVE AHEAD OF THE CREST OF A VERTICAL CURVE OR AROUND A HORIZONTAL CURVE AND WAIT UNTIL THE "LEFT OF CENTER" MARKING EQUIPMENT NEARS AND THEN PROCEED, MAINTAINING AN ADVANCE LOCATION OF 122 m TO 183 m.

A LEAD VEHICLE SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL DEVICES:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-31R-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE MEASURED TO THE BOTTOM OF THE SIGN, AND VISIBLE TO OPPOSING TRAFFIC.

POWER BROOM EQUIPMENT

POWER BROOM EQUIPMENT SHALL BE EQUIPPED AND OPERATED DURING PAVEMENT PREPARATIONS WITH THE FOLLOWING TRAFFIC CONTROL DEVICES:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
- * 3. A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) VISIBLE TO THE REAR MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS.

LINE MARKING MACHINE

ALL TRAFFIC LINE MARKING MACHINES SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL EQUIPMENT:

1. THREE 360° ROTATING OR FLASHING AMBER BEACONS CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m, MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, ONE FORWARD, ONE ON THE RIGHT REAR AND ONE ON THE LEFT REAR OF THE VEHICLE.
- * 2. (A) A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) DISPLAYED TO THE REAR MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS, OR
(B) A DO NOT PASS SIGN (R-33A-48) VISIBLE TO THE REAR DURING CENTER LINE MARKING ON TWO-LANE, TWO-WAY ROADWAYS AND MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN. THIS SIGN MAY BE USED TO COVER THE ARROW PANEL WHICH SHALL NOT BE USED ON TWO-LANE, TWO WAY ROADWAYS.
3. A WET PAINT WITH ARROW SIGN (OC-50-24 OR OC-51-48) SHALL FACE THE REAR. THE SIGN SHALL BE POSITIONED WITH THE ARROW POINTING TO THE WET LINE. WHEN USED, OC-50-24 SHALL BE MOUNTED ON THE SIDE OF THE VEHICLE NEAREST THE WET MARKING MATERIAL. OC-50-24 AND OC-51-48 SIGNS SHALL BE MOUNTED A MINIMUM OF 0.3 m ABOVE THE ROAD SURFACE.
4. A KEEP RIGHT SIGN (OC-31R-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN FACING OPPOSING TRAFFIC WHEN THIS UNIT EXTENDS INTO THE ADJACENT OPPOSING TRAFFIC LANE.
5. THE GUIDE AND SIDE MOUNTED MARKING CARRIAGES SHALL EACH BE EQUIPPED WITH A CLEAN RED FLAG NOT LESS THAN 0.4 m SQUARE AND FASTENED TO A STAFF OF SUFFICIENT LENGTH SO AS TO PERMIT THE FLAG TO MOVE FREELY OF ANY OBSTRUCTION.

TRAIL VEHICLE

WHEN REQUIRED, A TRAIL VEHICLE SHALL BE POSITIONED AT THE TRACK FREE END OF THE WET LINE.

TRAIL VEHICLES SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL EQUIPMENT:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m,
- * 2. (A) A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) VISIBLE TO THE REAR MOUNTED AT A MINIMUM HEIGHT OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS, OR
(B) A DO NOT PASS SIGN (R-33A-48) VISIBLE TO THE REAR DURING CENTER LINE MARKING ON TWO-LANE, TWO-WAY ROADWAYS AND MOUNTED A MINIMUM OF 2 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN. THIS SIGN MAY BE USED TO COVER THE ARROW PANEL, WHICH SHALL NOT BE USED ON TWO-LANE, TWO-WAY ROADWAYS.
3. A WET PAINT WITH ARROW SIGN (OC-50-24 OR OC-51-48) SHALL FACE THE REAR. THE SIGN SHALL BE POSITIONED WITH THE ARROW POINTING TO THE WET LINE. WHEN USED, OC-50.24 SHALL BE MOUNTED ON THE SIDE OF THE VEHICLE NEAREST, THE WET MARKING MATERIAL. OC-50-24 SHALL BE MOUNTED A MINIMUM OF 1.4 m ABOVE THE ROAD SURFACE AND OC-51-48 SHALL BE MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE, BOTH MEASURED TO THE BOTTOM OF THE SIGN.

* WHEN A VEHICLE IS OPERATING ON A TWO-LANE TWO-WAY ROADWAY THE FLASHING ARROW PANEL SHALL BE TILTED HORIZONTALLY OR COVERED.

CONES AND WET PAINT-KEEP OFF SIGNS

CONES AND WET PAINT-KEEP OFF SIGNS (R-87-24) SHALL BE PLACED TO PROTECT THE LINE WHENEVER THE TRACK FREE TIME EXCEEDS 2 MINUTES. THESE DEVICES SHALL NOT BE REMOVED UNTIL THE LINE HAS DRIED TO A TRACK FREE CONDITION. RETRIEVAL EQUIPMENT SHALL HAVE THE TRAFFIC CONTROL EQUIPMENT OF A TRAIL VEHICLE. CONES SHALL HAVE A MINIMUM HEIGHT OF 0.46 m. THEY SHALL BE SPACED TO PROTECT THE WET LINE NORMALLY BETWEEN 37 m AND 61 m. IN AREAS OF TRAFFIC CONGESTION, ON CURVES AND AT OTHER LOCATIONS WHERE TRACKING OF THE WET LINE IS EXPECTED SPACINGS AS CLOSE AS 6.1 m MAY BE REQUIRED. THE WET PAINT-KEEP OFF SIGNS (R-87-24) SHALL BE PLACED FACING TRAFFIC AT:

- A. THE BEGINNING AND END OF LINE APPLICATION,
- B. ALL SIDE AND CROSS ROADS, AND
- C. MAXIMUM INTERVALS OF 1.6 km.

WHEN LANE LINE MARKINGS REQUIRE GREATER THAN A TWO MINUTE DRYING TIME, THE LANE FROM WHICH THE LINE MARKING MACHINE APPLIES LANE LINE MARKINGS SHALL BE CLOSED UNTIL THE LINE HAS DRIED TO A TOTALLY TRACK FREE CONDITION.

IMMOBILE OPERATIONS

WHEN LOADING MATERIAL, CLEANING OR PERFORMING OTHER OPERATIONS IN THE FIELD, EVERY EFFORT SHALL BE MADE TO HAVE ALL EQUIPMENT COMPLETELY OFF OF THE TRAVELED WAY. WHEN IT BECOMES NECESSARY TO ENTER UPON PRIVATE PROPERTY, PERMISSION SHALL BE OBTAINED IN ADVANCE. WHEN THE CONTRACTOR CANNOT REMOVE HIS EQUIPMENT FROM THE TRAVELED WAY ALL TRAFFIC CONTROL DEVICES ON THE VEHICLES SHALL BE IN OPERATION AND FLAGGERS AND VEHICLES SHALL BE STATIONED TO PROTECT THE WORK SITE AND THE TRAVELING PUBLIC.

TWO-WAY TRAFFIC SHALL BE MAINTAINED. FLAGGERS SHALL BE EQUIPPED IN ACCORDANCE WITH ITEM 614.03.

AUXILIARY MARKINGS

PAVEMENT PREPARATION AND PLACING OF AUXILIARY MARKINGS (SEE ③) ARE CONSIDERED TO BE STATIONARY OPERATIONS AND TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH PLAN DETAILS, STANDARD CONSTRUCTION DRAWINGS AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD).

LAYOUT AND PREMARKING

THE VEHICLE USED IN LAYOUT AND PREMARKING SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING EQUIPMENT:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-31R-48) MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN, AND VISIBLE TO OPPOSING TRAFFIC.

NIGHTTIME OPERATION

NIGHTTIME OPERATION IS DEFINED TO INCLUDE THE TIME FROM ONE-HALF HOUR AFTER SUNSET TO ONE-HALF HOUR BEFORE SUNRISE, AND AT ANY OTHER TIME WHEN THERE ARE UNFAVORABLE ATMOSPHERIC CONDITIONS OR WHEN THERE IS NOT SUFFICIENT NATURAL LIGHT TO RENDER DISCERNIBLE PERSONS, VEHICLES, AND SUBSTANTIAL OBJECTS ON THE HIGHWAY AT A DISTANCE OF 305 m.

DURING NIGHTTIME CONDITIONS THE FOLLOWING TRAFFIC CONTROL SHALL BE PROVIDED:

1. CONES SHALL BE REFLECTORIZED OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY (SEE 7F-5, OMUTCD), AND
2. THE GUIDE AND SIDE-MOUNTED CARRIAGES SHALL BE ILLUMINATED.

THE PRESENCE OF HIGHWAY LIGHTING DOES NOT WAIVE THESE REQUIREMENTS.

MINIMUM PAVEMENT MARKING TRAFFIC CONTROL EQUIPMENT REQUIREMENTS

THIS TABLE INDICATES THE TRAFFIC CONTROL EQUIPMENT WHICH SHALL BE FURNISHED FOR EACH TYPE OF LONG LINE PAVEMENT MARKING OPERATION. IN ADDITION, THE TYPE OF TRAFFIC CONTROL EQUIPMENT WHICH SHALL BE FURNISHED WHEN DIRECTED BY THE ENGINEER IS INDICATED.

EQUIPMENT	PAVEMENT MARKING LINE TYPE ①					
	CENTER LINE		EDGE LINE		LANE LINE CHANNELIZING LINE ② ③	
	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY
LEAD VEHICLE	A	A	C	C	C	C
POWER BROOM EQUIPMENT	B	B	A	A	B	B
LINE MARKING MACHINE	A	A	A	A	A	A
TRAIL VEHICLE	D	A	D	A	LANE CLOSURE REQUIRED (0.7 m CONES REQUIRED)	A
TRAIL VEHICLE (ADDITIONAL)	C	B	C	B		A
TRAIL VEHICLE (SIGN & CONE RETRIEVAL)	A	C	A	C		C
TRAIL VEHICLE (SHADOW FOR RETRIEVAL)	A	C	A	C		C

① FOR EQUIPMENT REQUIREMENTS FOR AUXILIARY MARKING OPERATIONS SEE THE PLANS AND PART 7, OMUTCD.

② INCLUDES BOTH DASHED AND SOLID LANE LINES.

③ CHANNELIZING LINE SEGMENTS OF 61 m OR LESS SHALL BE CONSIDERED AUXILIARY MARKINGS, EXCEPT WHEN APPLIED AS COMPONENTS OF GORE MARKINGS SPRAYED IN MOVING OPERATIONS SEPARATE FROM THE APPLICATION OF TRANSVERSE LINES.

A	REQUIRED EQUIPMENT
B	EQUIPMENT REQUIRED WHEN DIRECTED BY THE ENGINEER
C	NOT REQUIRED
D	REQUIRED EQUIPMENT FOR SIGN & CONE PLACEMENT

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE
TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS	01/30/95
STANDARD CONSTRUCTION DRAWING	MT-99.20M

APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

TEMPORARY SIGN SUPPORT REQUIREMENTS

A. PLACEMENT OF SIGNS WHICH WILL REMAIN MORE THAN ONE DAY:

- 1) LATERAL PLACEMENT TO NEAREST EDGE OF SIGNS SHALL BE AS FOLLOWS:
 - a) ON THE RIGHT SIDE OF THE ROAD FOR APPROACHING TRAFFIC (EXCEPT FOR DUAL MOUNTED SIGNS AND SIGNS DESIGNATED IN THE PLANS FOR LEFT SIDE MOUNTING).
 - b) CURBED ROADWAY - MINIMUM 0.6 m BEHIND FACE OF CURB.
 - c) UNCURBED ROADWAY - 3.7 m FROM EDGE OF TRAFFIC LANE OR 1.8 m FROM EDGE OF PAVED OR USEABLE SHOULDER, WHICHEVER IS GREATER.
 - d) BEHIND GUARDRAIL OR BARRIER - PREFERABLY 0.6 m BEHIND FACE OF GUARDRAIL (MINIMUM 0.3 m) FOR SIGNS ON CLASS A SUPPORTS; 1.2 m FOR CLASS B OR C SUPPORTS; 0.3 m BEHIND FACE OF CONCRETE BARRIER UNLESS BARRIER TOP MOUNTING IS REQUIRED BY THE PLAN.
- 2) VERTICAL CLEARANCE OF SIGNS, MEASURED ABOVE ROADWAY ELEVATION; SHALL BE AS FOLLOWS:
 - a) RURAL - 1.5 m WHEN PARKED CARS, CONSTRUCTION EQUIPMENT, ETC WILL NOT OBSCURE SIGN VISIBILITY.
 - b) RURAL AREAS WITH PARKED CARS OR CONSTRUCTION EQUIPMENT - 2.1 m
 - c) URBAN - 2.1 m
 - d) CARE SHALL BE TAKEN TO ASSURE THAT SIGNS WILL NOT BE OBSCURED BY CONSTRUCTION EQUIPMENT, TREES, WEEDS OR OTHER OBSTACLES. BRUSH, WEEDS OR GRASS WITHIN THE RIGHT OF WAY SHALL BE TRIMMED AS NECESSARY. SIGNS SHALL NORMALLY BE VISIBLE TO TRAFFIC 122 m TO 183 m IN ADVANCE OF THE SIGN.
- 3) SUPPORTS FOR SIGNS WHICH WILL REMAIN IN PLACE MORE THAN ONE DAY SHALL BE FIXED RATHER THAN PORTABLE EXCEPT IN SITUATIONS WHERE THE SIGN MUST REST ON PERMANENT PAVEMENT OR OTHER SURFACE WHICH WOULD BE DAMAGED BY INSERTION OF POST TYPE SUPPORTS.

B. PLACEMENT OF SIGNS WHICH WILL REMAIN FOR ONE DAY OR LESS:

- 1) SAME AS A-1 ABOVE EXCEPT THAT SIGNS MAY BE PLACED ON THE ROADWAY ONLY IF THEY DO NOT INTRUDE INTO A TRAFFIC LANE IN USE.
- 2) MINIMUM OF 0.3 m ABOVE ROADWAY

C. CLASSES OF SUPPORTS:

ALL TEMPORARY SIGN SUPPORTS SHALL BE OF THE FOLLOWING TYPES:

1) CLASS A:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF 40 MPH AND HIGHER ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL OTHER LOCATIONS.

2) CLASS B:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF LESS THAN 40 MPH ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL APPLICATIONS DEFINED FOR CLASS C SUPPORTS.

3) CLASS C:

SUPPORTS MAY ONLY BE USED WHERE FULLY PROTECTED BY GUARDRAIL, CONCRETE BARRIER AND IN LOCATIONS POSITIVELY PROTECTED FROM TRAFFIC SUCH AS ON RETAINING WALLS OR WHERE TRAFFIC APPROACH SPEEDS ARE LESS THAN 25 MPH.

D. TRAFFIC APPROACH SPEEDS:

TRAFFIC APPROACH SPEEDS SHALL BE THE LOCALLY POSTED SPEED (NOT ADVISORY SPEED SIGNS) OR THE MEASURED ACTUAL (85TH PERCENTILE) SPEED (IF AVAILABLE) OF APPROACHING TRAFFIC, WHICHEVER IS HIGHER, ADJACENT TO THE SIGN LOCATION.

TABLE

APPROACH SPEED (MPH)	COMPLETELY PROTECTED BY GUARDRAIL OR BARRIER	PARTLY PROTECTED BY GUARDRAIL OR BARRIER *	GREATER THAN 9 m FROM EDGE OF PAVEMENT	WITHIN 9 m FROM EDGE OF PAVEMENT
40 AND HIGHER	A, B OR C	A OR B	A OR B **	A ONLY
26 TO 39	A, B OR C	A OR B	A OR B	A OR B
0 TO 25	A, B OR C	A, B OR C	A, B OR C	A, B OR C

* IF SUPPORTS ARE BEHIND GUARDRAIL BUT NOT FULLY 1.7 m BEHIND FACE OF RAIL OR IF SIGN IS NOT 0.3 m BEHIND FACE OF CONCRETE BARRIER.

** 9 m CRITERION IS BASED UPON STRAIGHT ROADWAY AND A SLOPE OF 6 TO 1 OR FLATTER. SUPPORTS ON THE OUTSIDE OF CURVES OR LOCATED DOWN A SLOPE (STEEPER THAN 6 : 1) WILL REQUIRE USE OF CLASS A SUPPORTS.

E. BALLASTING

BALLASTING OF PORTABLE SUPPORTS SHALL BE WITH SANDBAGS PLACED WITHIN 0.3 m OF THE GROUND. IN NO CASE SHALL HARD OBJECTS BE USED FOR BALLAST.

F. STRENGTH OF SIGN SUPPORTS

THE CONTRACTOR SHALL CHOOSE SIGN SUPPORTS OF ADEQUATE STRENGTH AND WITH ADEQUATE FOUNDATIONS AND ANCHORAGE TO SUPPORT THE SIGN SIZES ERECTED. PROPRIETARY DEVICES SHALL NOT BE LOADED BEYOND THE LIMITS RECOMMENDED BY THE MANUFACTURER. SLIP BASE TYPE BREAKAWAY BEAM CONNECTIONS SHALL BE AT LEAST PARTIALLY EMBEDDED IN CONCRETE CONSISTING OF A 0.3 m DEEP BY 0.3 m DIAMETER COLLAR. SIGN SUPPORTS WHICH FAIL UNDER TYPICAL WIND LOAD CONDITIONS SHALL BE IMMEDIATELY MODIFIED OR REPLACED WITH A SUPPORT OF ADEQUATE STRENGTH.

G. PROHIBITED SUPPORTS

THE FOLLOWING SUPPORT TYPES SHALL NOT BE PERMITTED ON PROJECTS:

- 1) SUPPORTS FABRICATED FROM AUTOMOTIVE AXLE DIFFERENTIAL ASSEMBLIES AND SIMILARLY HEAVY ASSEMBLIES WHICH CANNOT BE CONSIDERED BREAKAWAY TYPE.
- 2) SUPPORTS CONSISTING OF VERTICAL POSTS WITH ANGLED BRACES MADE FROM DRIVEPOST OR OTHER RIGID ELEMENTS.

CLASS A SUPPORTS

FIXED SUPPORTS

- 1) ALL #2 AND #3 POST WHEN INSTALLED SINGLY OR IN PAIRS (SIDE BY SIDE) ACCORDING TO THE DETAILS OF TC-41.20M. THE NUMBER OF SUPPORTS SHALL BE AS SHOWN ON TC-52.10M AND TC-52.20M.
- 2) THE FOLLOWING POST TYPES, WHEN INSTALLED SINGLY, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m.
 - a) - UP TO 102 X 102 mm WOOD.
 - b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
 - c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
 - d) - UP TO 56.4 mm SQUARE, 12 GAUGE WALL, PUNCHED STEEL POST.
 - e) - UP TO 152 X 203 mm WOOD WITH BREAKAWAY HOLES SHOWN BELOW.
- 3) THE FOLLOWING POST TYPES WHEN INSTALLED IN PAIRS (SIDE BY SIDE) WITH LESS THAN 2 m BETWEEN POSTS, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m:
 - a) - UP TO 102 X 102 mm WOOD.
 - b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.
 - c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.
 - d) - UP TO 51 mm SQUARE, 14 GAUGE WALL, PUNCHED STEEL POST.
- 4) FIXED TYPE III BARRICADES:
- 5) ALL BREAKAWAY CONNECTION BEAM SUPPORTS, WHEN INSTALLED ACCORDING TO THE PROPER DETAILS SHOWN ON TC-41.10M WITH A MINIMUM CLEAR DISTANCE BETWEEN SUPPORTS OF 2.1 m FOR SUPPORTS LARGER THAN W6 X 9.
- 6) ANY BREAKAWAY POST OR POST AND CONNECTION WHICH HAS BEEN CRASH TESTED AND APPROVED BY THE FHWA AS SATISFYING THE BREAKAWAY CRITERIA DESCRIBED IN 630.06.

(CONTINUED ON MT-105.11M)

M E T R I C

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE

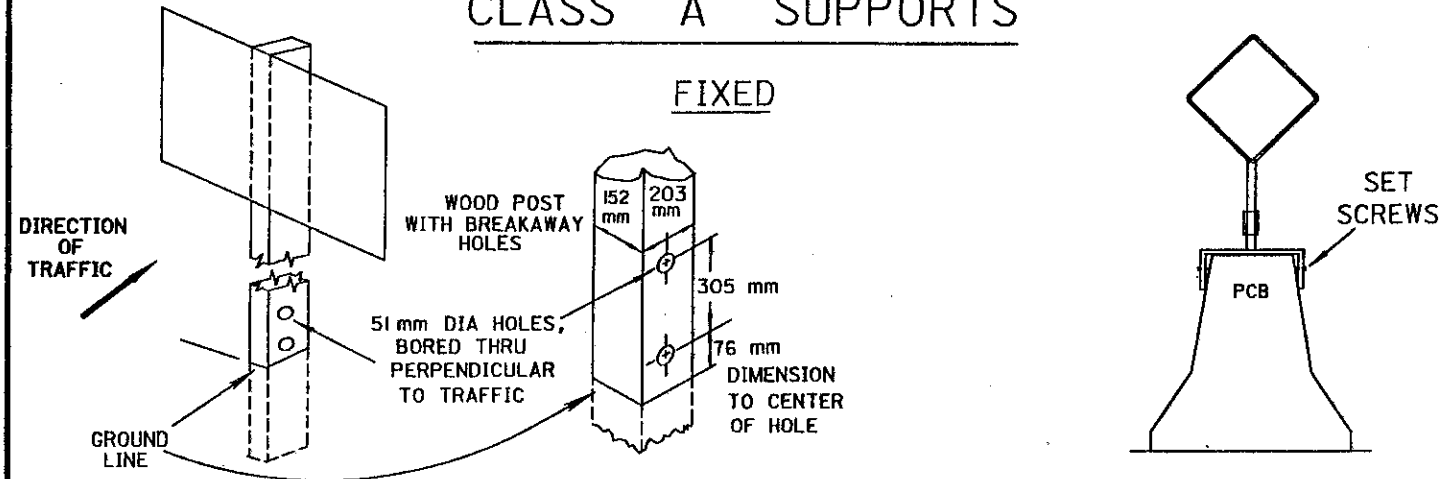
TEMPORARY SIGN SUPPORT

04/25/94

STANDARD
CONSTRUCTION
DRAWING
APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

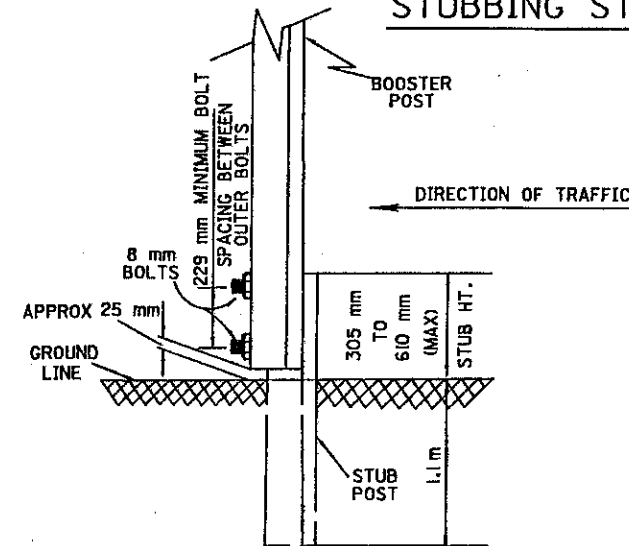
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CLASS A SUPPORTS



CLASS A SUPPORTS

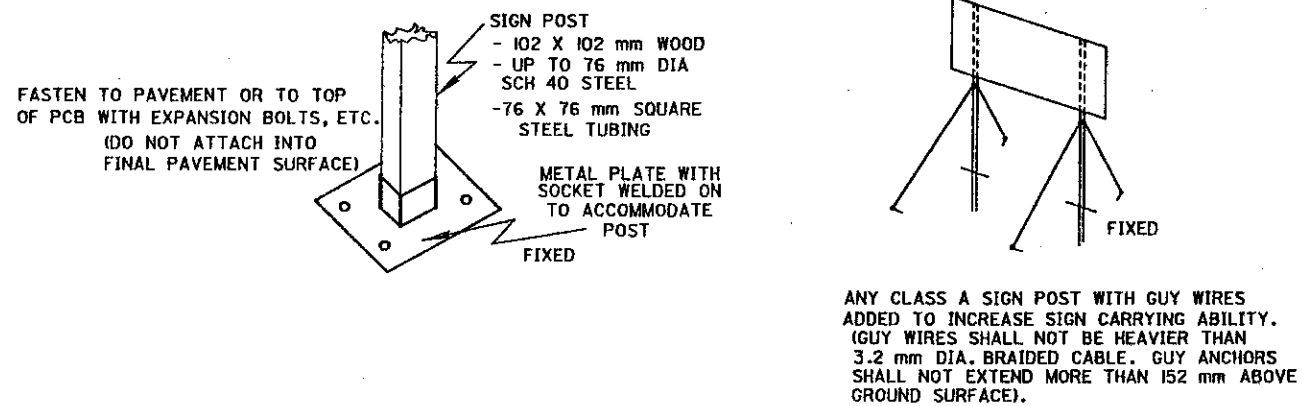
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NOTES

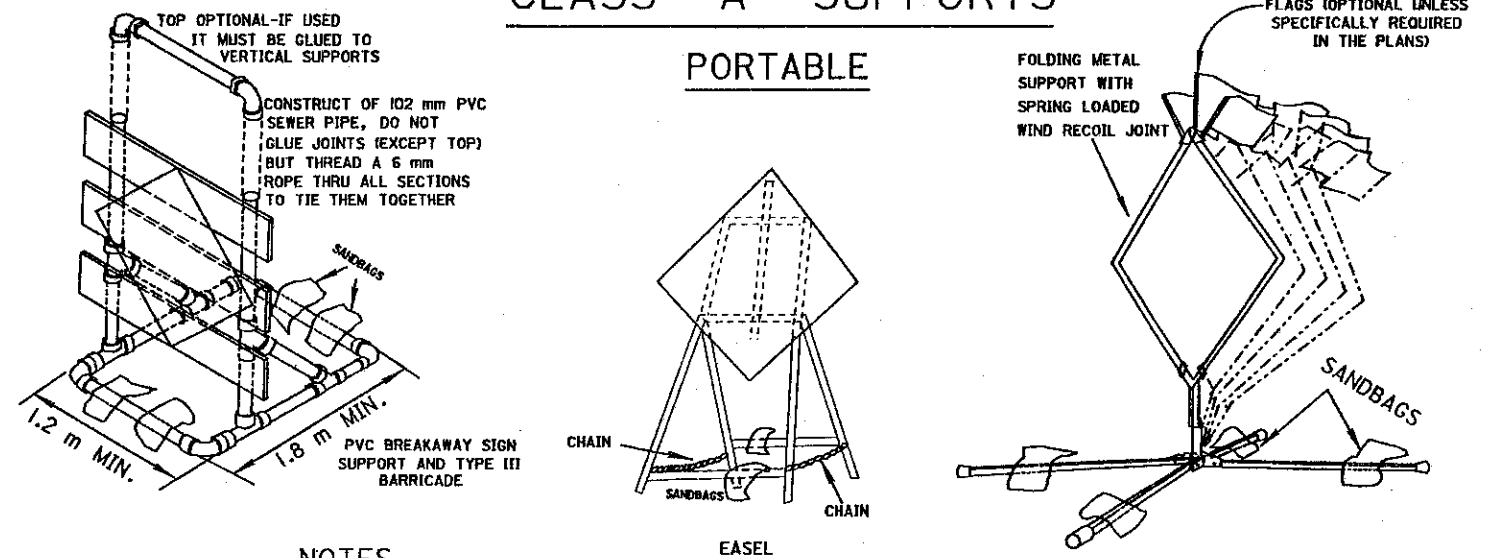
1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1.5 kg/m LESS THAN STUB POST

CLASS B SUPPORTS



CLASS A SUPPORTS

PORTABLE

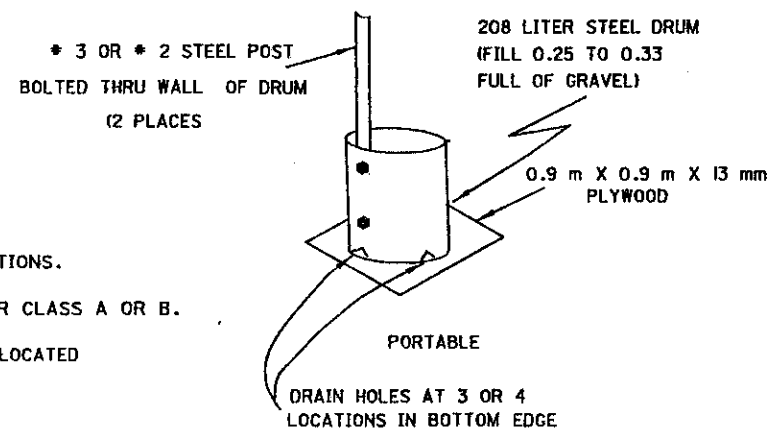


NOTES

RAIL MATERIALS:

- 25 X 203 mm OR 51 X 203 mm COMMON LUMBER
- 203 mm X (16 mm TO 25 mm) THICK EXTERIOR PLYWOOD
- EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICIENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 147 kg/m², BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

CLASS C SUPPORTS



1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF THE OMTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE
04/25/94

TEMPORARY SIGN SUPPORT

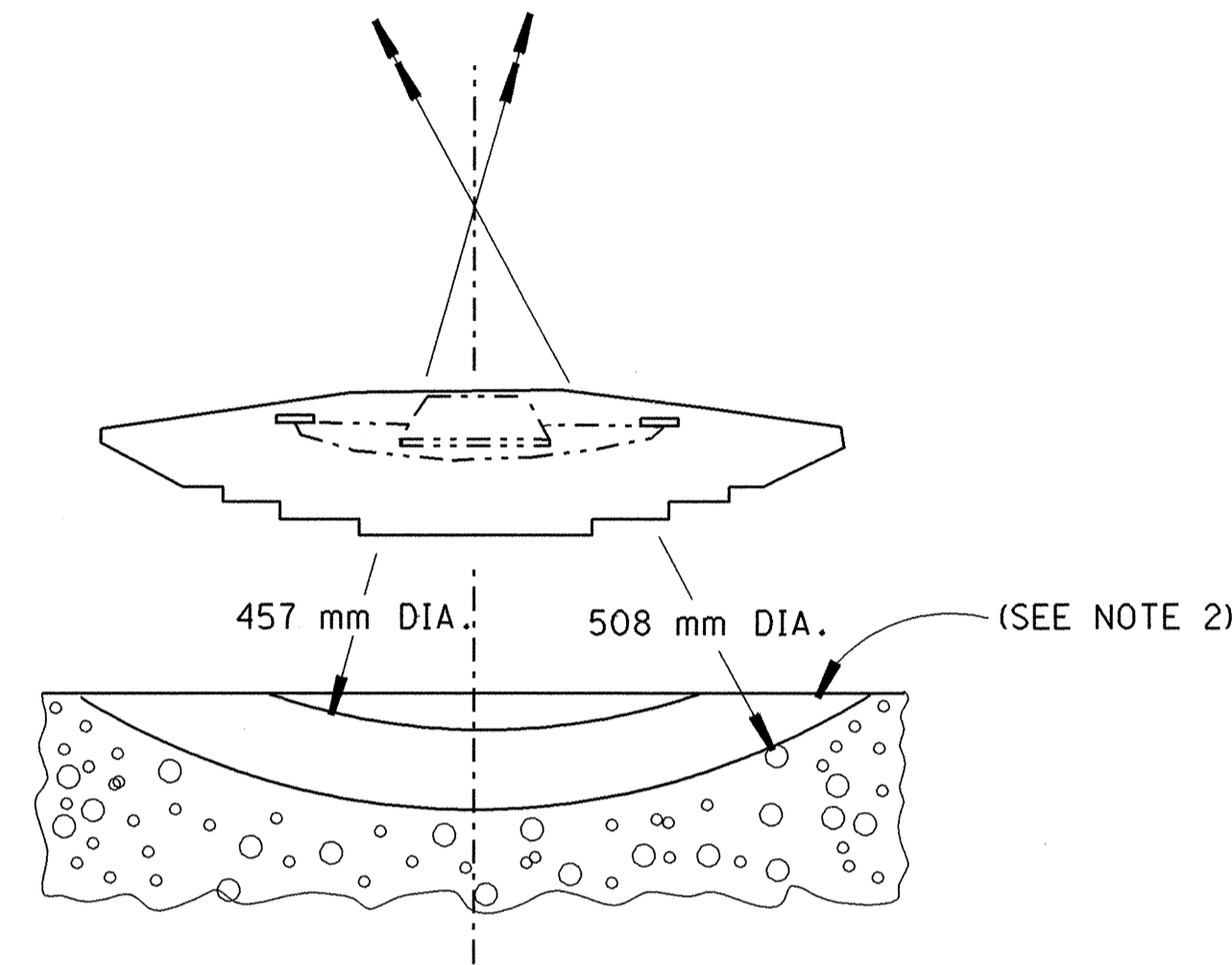
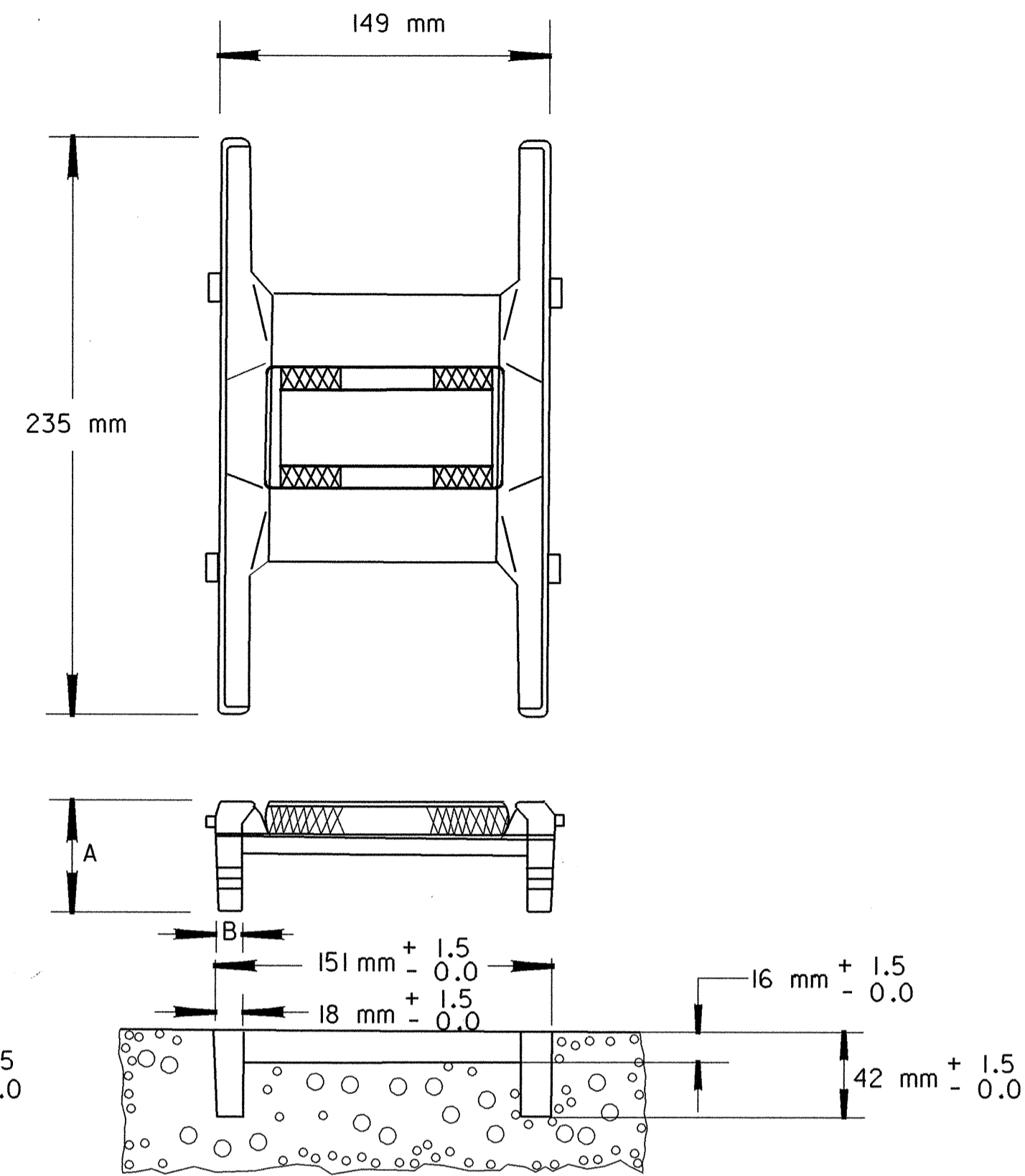
STANDARD CONSTRUCTION DRAWING
DRAWING MT-105.IIM
APPROVED *David J. C...* ENGR. OF DESIGN SERVICES

METRIC

NOTES

1. CENTER LINE MARKERS SHALL BE PLACED BETWEEN THE TWO LINES. MARKERS INSTALLED ALONG AN EDGE LINE OR CHANNELIZING LINE SHALL BE PLACED SO THAT THE CASTING IS NO MORE THAN 25 mm FROM THE NEAR EDGE OF THE LINE. MARKERS INSTALLED ALONG A LANE LINE OR DASHED YELLOW CENTER LINE SHALL BE PLACED BETWEEN AND IN LINE WITH THE DASHES. MARKERS SHALL NOT BE PLACED OVER THE LINES EXCEPT WHERE THE LINES DEVIATE VISIBLY FROM THEIR CORRECT ALIGNMENT, AND THEN ONLY WITH THE APPROVAL OF THE ENGINEER.
2. TO FACILITATE THE CUTTING OF THE TWO PARALLEL SLOTS AND INTERVENING CONCAVED SURFACE SIMULTANEOUSLY, IT IS RECOMMENDED THAT AN ARBOR AND SAW BLADES ASSEMBLY BE USED. FOR ADDITIONAL DETAILS AND TOLERANCES OF THE CASTING AND ARBOR-SAW ASSEMBLY CONTACT THE CASTING MANUFACTURE.
3. FOR HORIZONTAL CURVE RADIUS OF 380 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 12 m BETWEEN P.C. OR T.S. AND P.T. OR S.T.
4. FOR HORIZONTAL CURVE RADIUS OF 250 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 6 m BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 6m SPACING, 12 RAISED PAVEMENT MARKERS AT 12 m SPACING SHALL BE INSTALLED ON EACH END OF THE 6 m SPACING.
5. WHEN A CHANNELIZING LINE IS LESS THAN 24 m IN LENGTH, ONE RAISED PAVEMENT MARKER SHALL BE PLACED AT EACH END OF THE LINE AND ONE SHALL BE PLACED IN THE CENTER OF THE LINE.
6. RAISED PAVEMENT MARKERS ON LANE LINES ON FREEWAYS SHALL BE ONE WAY WHITE SPACED AT 36 METERS. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 24 METERS.

	CONVENTIONAL TYPE	LOW PROFILE TYPE
A	44 mm	43 mm
B	12 mm	15 mm



CASTING AND SAW CUT DETAILS

EDGE LINE

ONE WAY (WHITE) WITH RIGHT EDGE LINE OR
ONE WAY (YELLOW) WITH LEFT EDGE LINE OR
TWO WAY (YELLOW/RED) WITH LEFT EDGE LINE ON RAMP
YELLOW SIDE FACING TRAFFIC

CHANNELIZING LINE

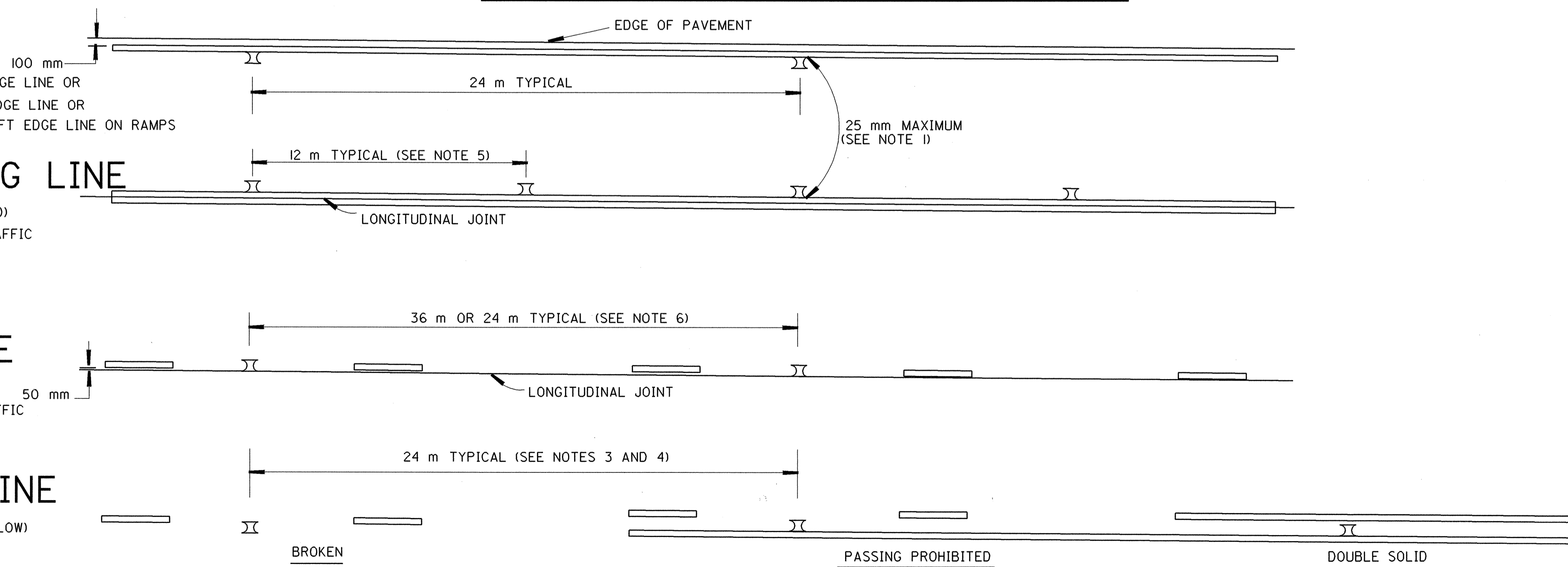
TWO WAY (WHITE/RED)
WHITE SIDE FACING TRAFFIC

LANE LINE

ONE WAY (WHITE) OR
TWO WAY (WHITE/RED)
WHITE SIDE FACING TRAFFIC

CENTER LINE

TWO WAY (YELLOW/YELLOW)



TYPICAL RAISED PAVEMENT MARKER PLACEMENT WITH LONGITUDINAL PAVEMENT MARKINGS



metric
units

OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

DATE
11/03/93
11/01/95

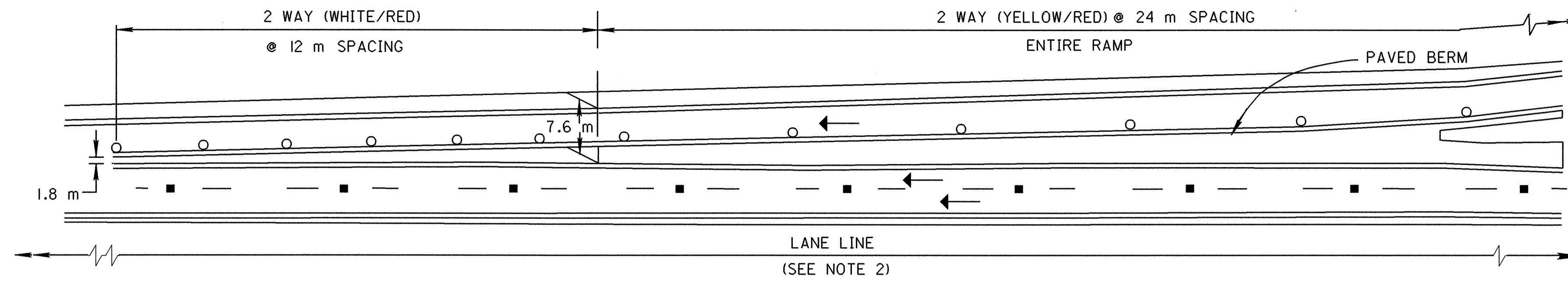
RAISED PAVEMENT MARKER
INSTALLATION DETAILS

STANDARD
CONSTRUCTION DRAWING
TC-65.10M

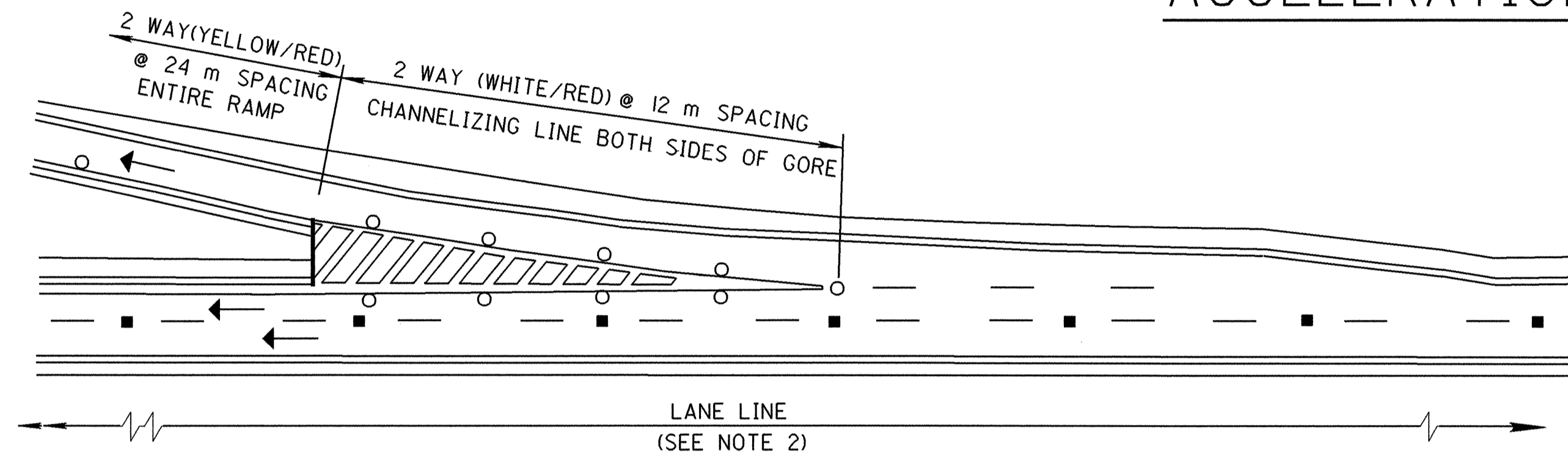
APPROVED *[Signature]* ADMINISTRATOR

NOTES

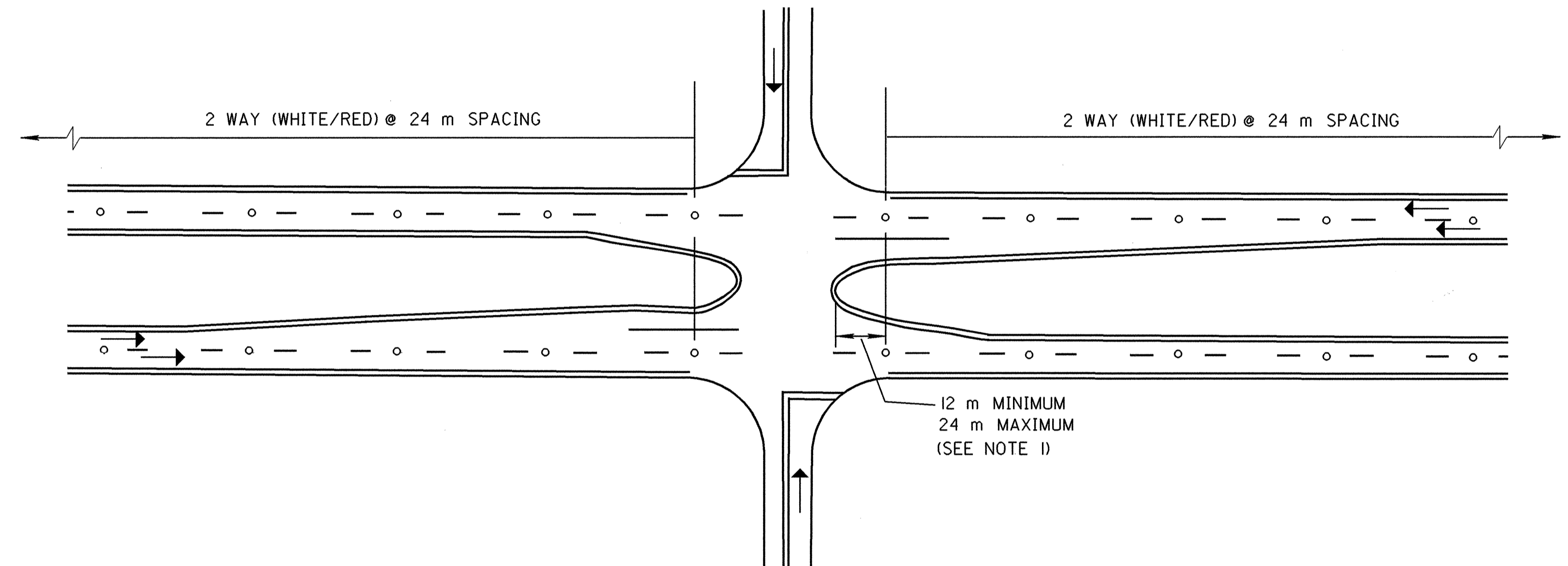
1. RAISED PAVEMENT MARKERS SHALL NOT BE PLACED IN THE DIRECTIONAL ROADWAYS WITHIN THE INTERSECTION AREA.
2. RAISED PAVEMENT MARKERS ON LANE LINES ON FREEWAYS SHALL BE ONE WAY WHITE SPACED AT 36 METERS. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 24 METERS.



ACCELERATION LANE

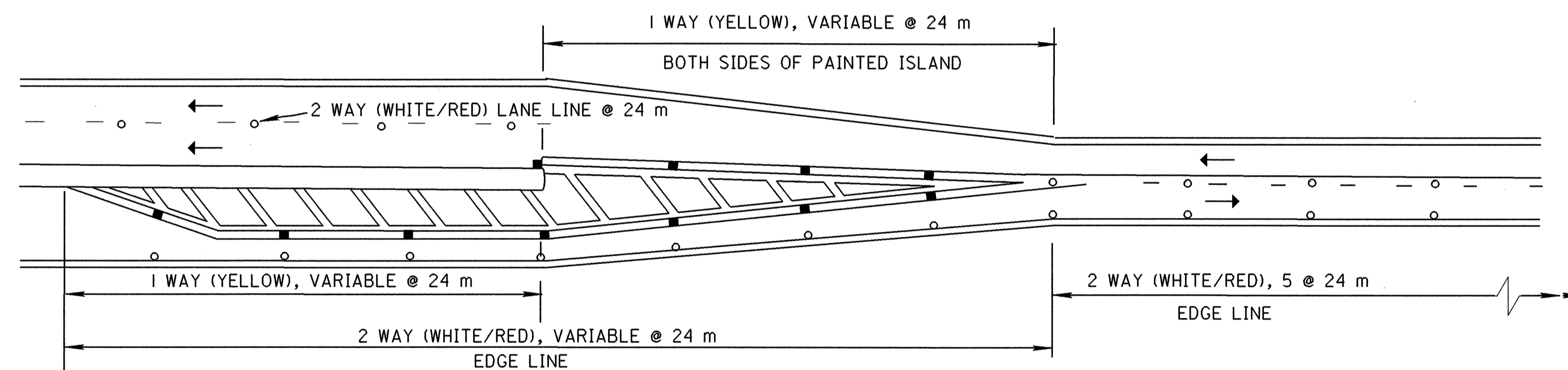


DECELERATION LANE

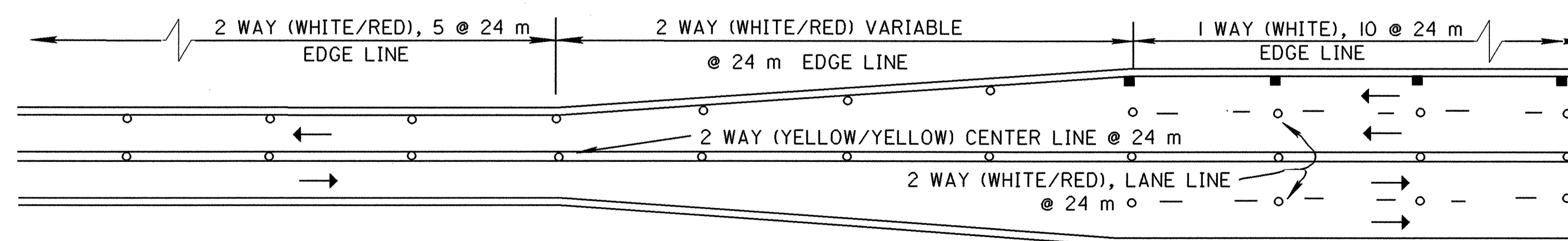


MULTILANE DIVIDED-CONTROLLED ACCESS

(SEE NOTE 2)



4 LANE DIVIDED TO 2 LANE TRANSITION



4 LANE UNDIVIDED TO 2 LANE TRANSITION

LEGEND

- 1 WAY REFLECTORS
- 2 WAY REFLECTORS



metric
units

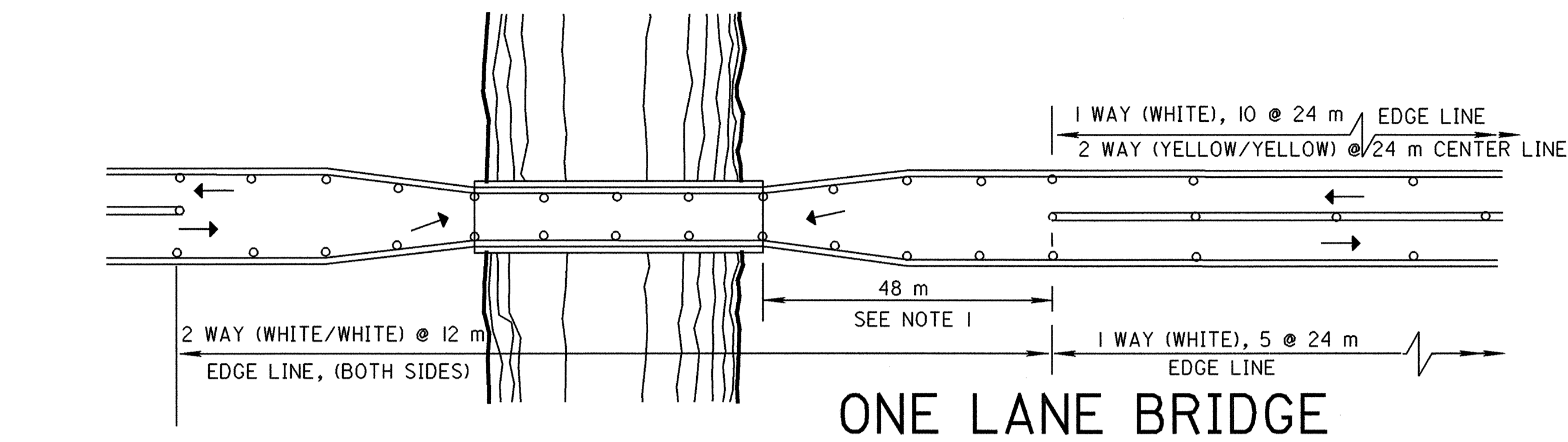
OFFICE OF TRAFFIC ENGINEERING DIVISION OF ENGINEERING POLICY OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 11/03/93 11/01/95
RAISED PAVEMENT MARKER DETAILS I	
STANDARD CONSTRUCTION DRAWING	TC-65.IIM
APPROVED <i>[Signature]</i> ADMINISTRATOR	

NOTES

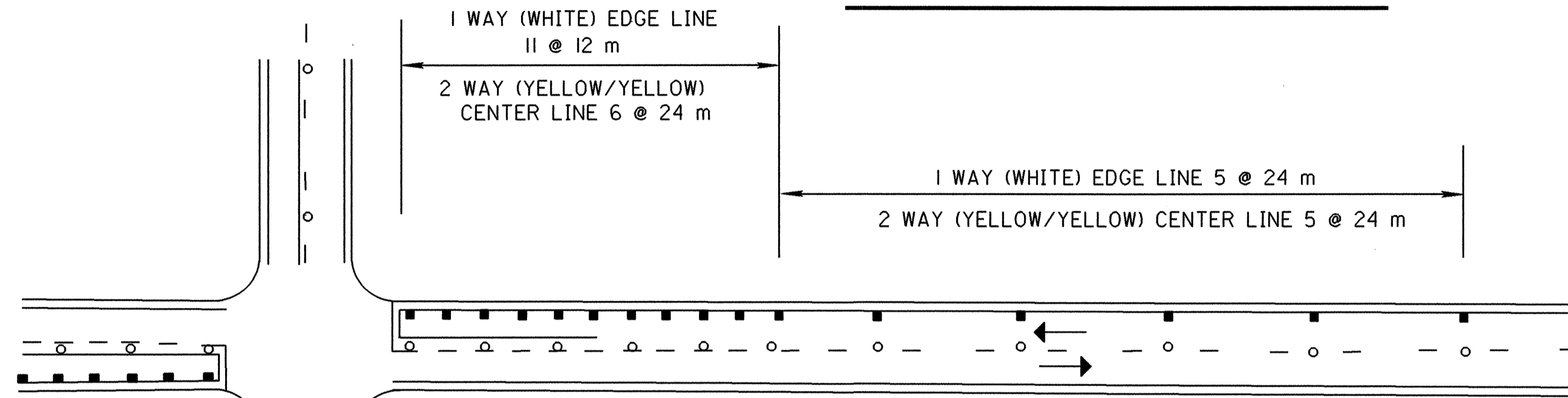
1. FOR ONE LANE BRIDGES, PAINTED CENTER LINE AND CENTER LINE MARKERS SHALL BE OMITTED 48 METERS ON EACH SIDE AND ACROSS THE BRIDGE.
2. FOR HORIZONTAL CURVE RADIUS OF 380 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 12 m BETWEEN P.C. OR T.S. AND P.T. OR S.T.
3. FOR HORIZONTAL CURVE RADIUS OF 250 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 6 m BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 6 m SPACING, 12 RAISED PAVEMENT MARKERS AT 12 m SPACING SHALL BE INSTALLED ON EACH END OF THE 6 m SPACING.
4. A MINIMUM OF 3 EQUALLY SPACED RAISED PAVEMENT MARKERS SHALL BE INSTALLED ON THE BACK TAPER.
5. WHEN A CHANNELIZING LINE IS LESS THAN 24 m LONG, ONE RAISED PAVEMENT MARKER SHALL BE PLACED AT EACH END OF THE LINE AND ONE SHALL BE PLACED IN THE CENTER OF THE LINE.
6. RAISED PAVEMENT MARKERS SHALL NOT BE PLACED ON EDGE LINES ON A THROUGH APPROACH.
7. ALL APPROACHES AT A SIGNALIZED INTERSECTION SHALL BE TREATED AS SHOWN IN THE STOP APPROACH DETAIL.

LEGEND

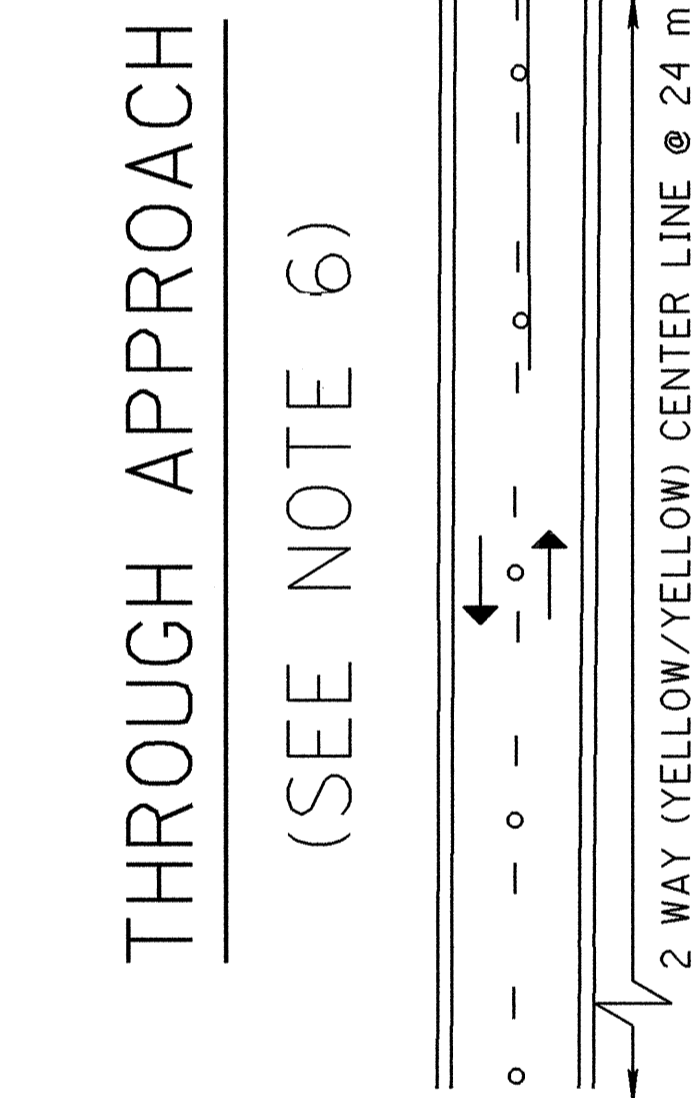
- 1 WAY REFLECTORS
- 2 WAY REFLECTORS



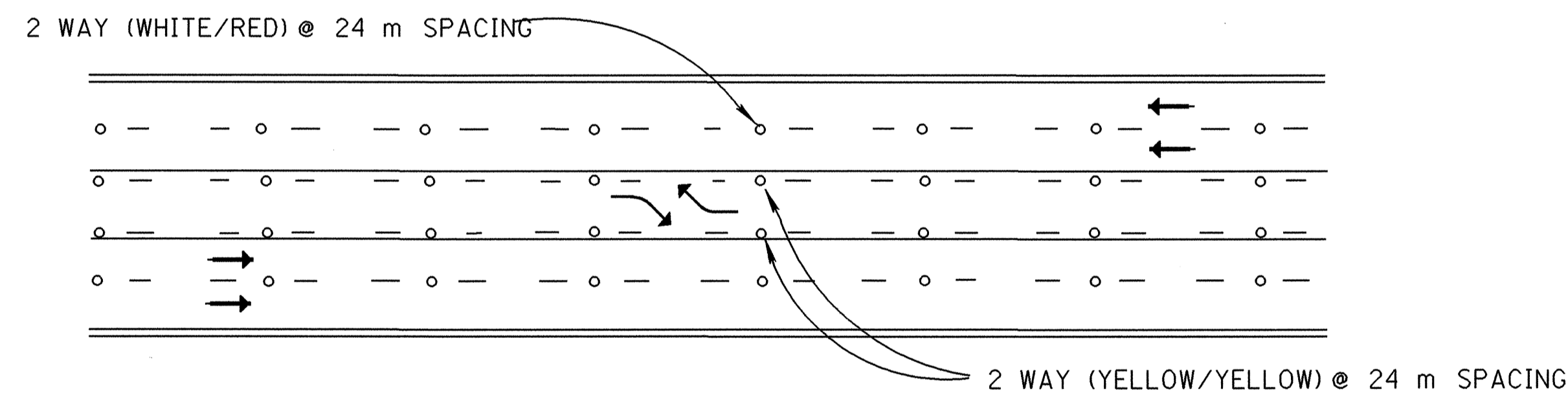
ONE LANE BRIDGE



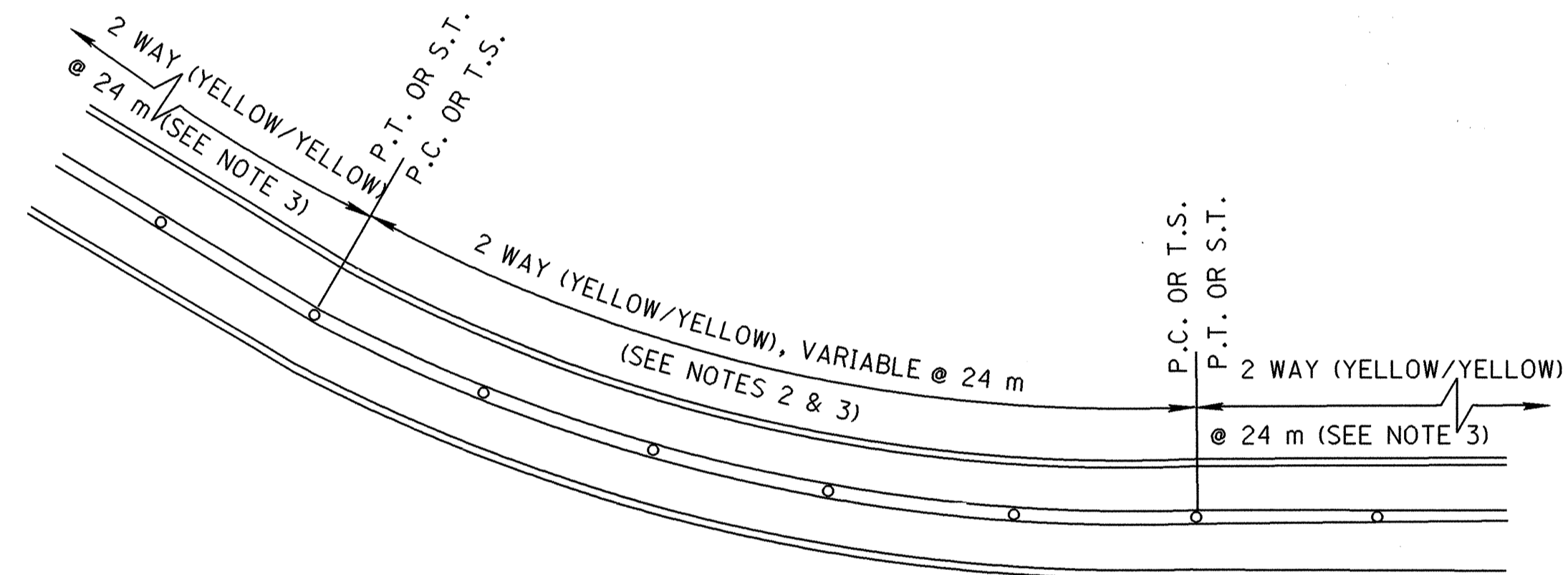
STOP APPROACH
(SEE NOTE 7)



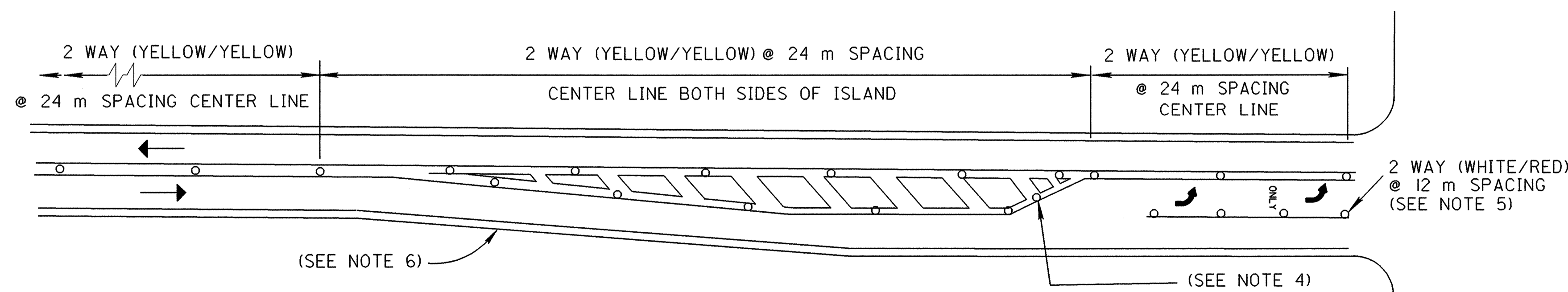
THROUGH APPROACH
(SEE NOTE 6)



TWO WAY LEFT TURN LANE



HORIZONTAL CURVE



APPROACH W/LEFT TURN LANE



**metric
units**

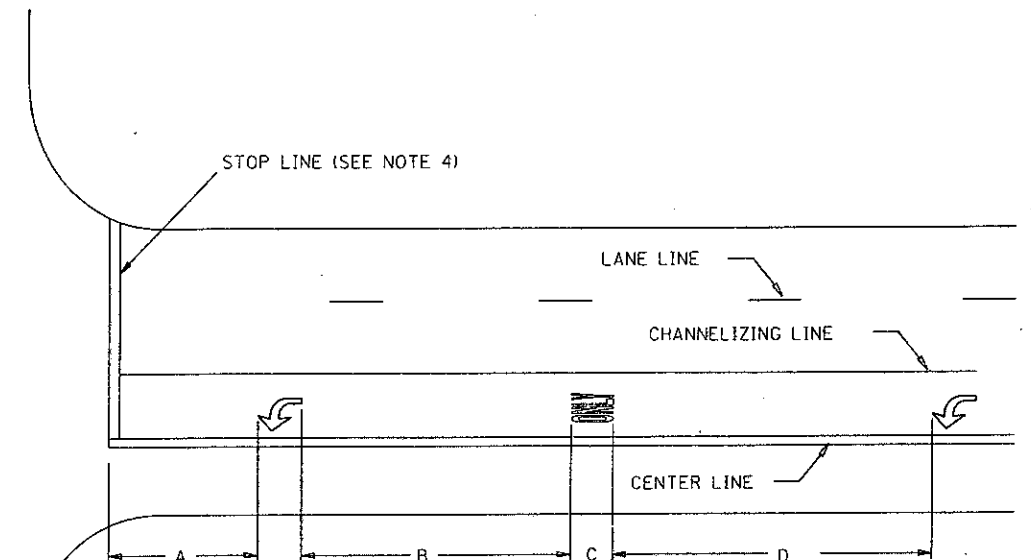
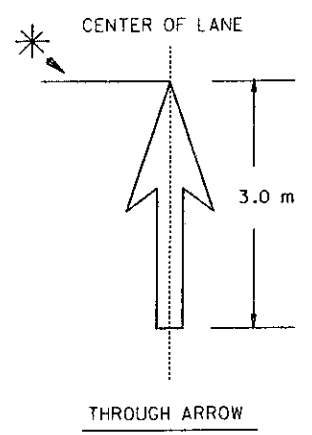
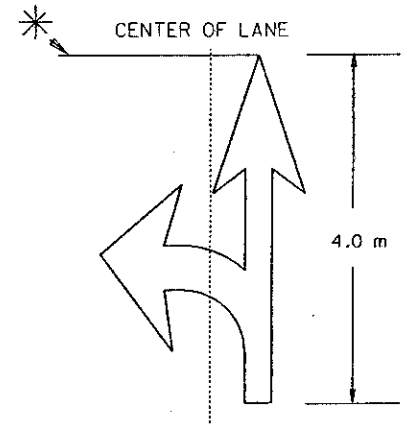
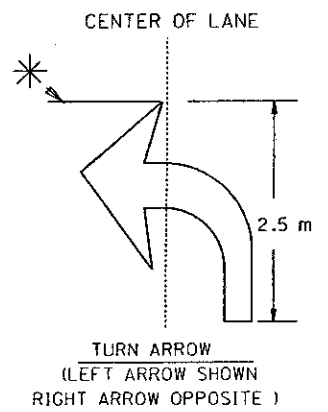
OFFICE OF TRAFFIC ENGINEERING DIVISION OF ENGINEERING POLICY OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 11/03/93
RAISED PAVEMENT MARKER DETAILS II	11/01/95
STANDARD CONSTRUCTION DRAWING	TC-65.12M
APPROVED <i>[Signature]</i>	ADMINISTRATOR

NOTES

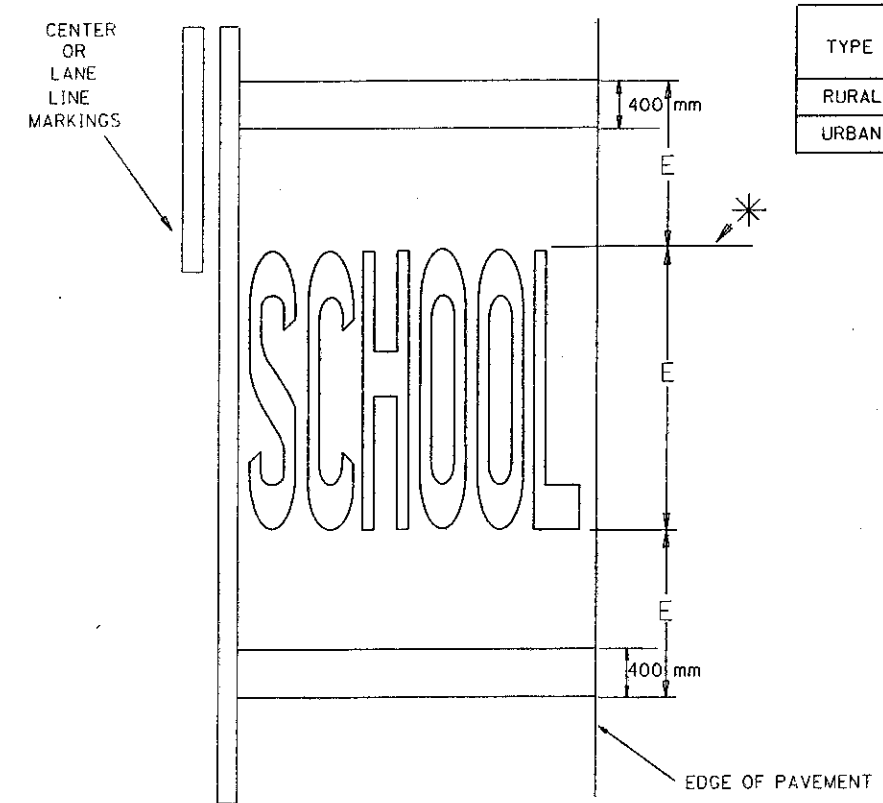
- ON MULTI-LANE APPROACHES, THE TRANSVERSE LINES USED WITH THE RAILROAD SYMBOLS SHALL EXTEND ACROSS ALL APPROACH LANES AND SYMBOLS SHALL BE PLACED IN EACH APPROACH LANE.
- THE RAILROAD SYMBOL SHALL BE LOCATED SO THAT THE W-94, "RAILROAD ADVANCE WARNING SIGN", IS WITHIN THE TWO TRANSVERSE BOUNDARY LINES OF THE RAILROAD SYMBOL. THE STOP LINE SHALL BE LOCATED FOR BEST SIGHT DISTANCE WITHIN 5 METERS TO 15 METERS OF THE NEAR EDGE OF THE TRACKS. WIDTH OF "X" MAY VARY ACCORDING TO LANE WIDTH. STOP LINES SHALL BE APPROXIMATELY 2.4 METERS FROM A GATE (IF PRESENT).
- PREFERABLY, THE WORD "SCHOOL" SHOULD BE CONTAINED IN A SINGLE LANE. ON ONE LANE APPLICATIONS, THE TRANSVERSE LINES SHALL EXTEND ACROSS THE LANE WHICH APPROACHES THE ZONE WITH THE WORD "SCHOOL" CENTERED ACROSS THAT LANE. FOR TWO APPROACH LANES, EACH LANE SHOULD HAVE A SEPARATE WORD "SCHOOL" CENTERED ACROSS IT. ON TWO LANE, TWO WAY ROADWAYS WITH INSUFFICIENT PAVEMENT WIDTH, THE WORD AND TRANSVERSE LINES SHALL EXTEND ACROSS BOTH LANES OF TRAFFIC. ON FOUR LANE, TWO WAY ROADWAYS WITH INSUFFICIENT PAVEMENT WIDTH, THE WORD AND TRANSVERSE LINES SHALL EXTEND ACROSS BOTH LANES ENTERING THE SCHOOL ZONE. CENTER OR LANE LINES SHALL NOT PASS THROUGH THE "SCHOOL" MARKING.
- THE STOP LINE SHOULD BE PLACED WHERE CROSS-CORNER VISION IS MAXIMUM, IN NO CASE MORE THAN 9.1 METERS OR LESS THAN 1.2 METERS FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY. FOR NORMAL INTERSECTIONS A MAXIMUM DISTANCE OF 3 METERS IS RECOMMENDED.

IF A MARKED CROSSWALK IS PRESENT, THE STOP LINE SHOULD BE PLACED 1.2 METERS IN ADVANCE OF AND PARALLEL TO THE NEAREST CROSSWALK LINE.
- FOR TRAFFIC PAINT AND POLYESTER APPLICATION, TEMPLATE GAPS SHALL BE FILLED WITH MARKING MATERIAL IN ACCORDANCE WITH 641.03. FOR EXTRUDED THERMOPLASTIC MATERIAL, THESE GAPS MAY REMAIN UNFILLED IN ACCORDANCE WITH 644.03.
- USE STANDARD DIMENSIONS CONFORMING TO REQUIREMENTS OF OMUTCD SECTIONS 3B-40, 3B-41 AND 3B-43 WHICH CONFORMS TO THE 1977 METRIC EDITION STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING WITH ERRATA.

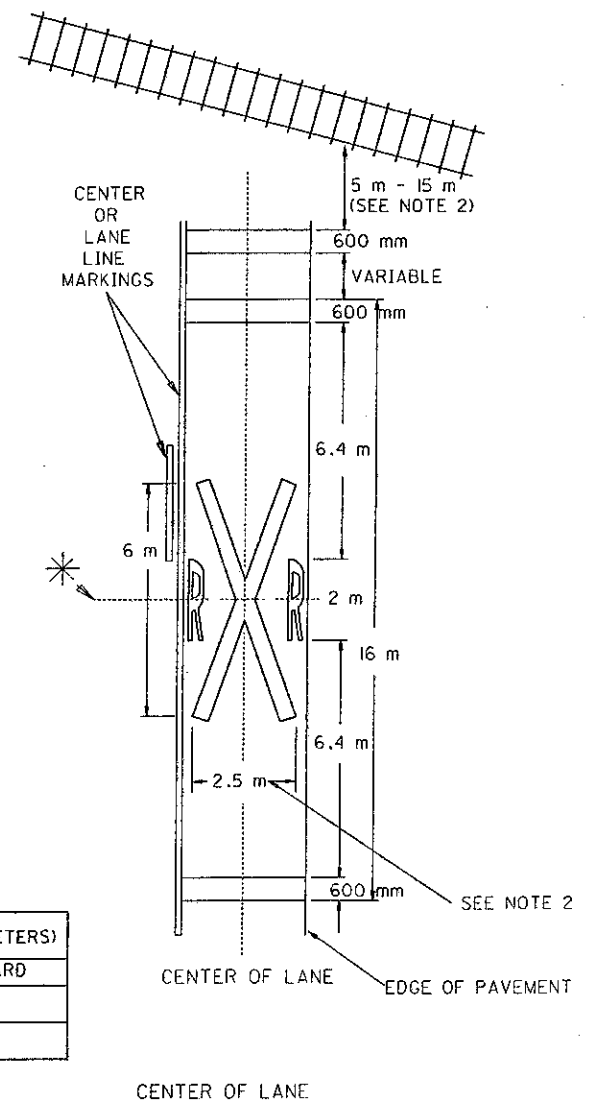
* - INDICATES STATION REFERENCE POINT



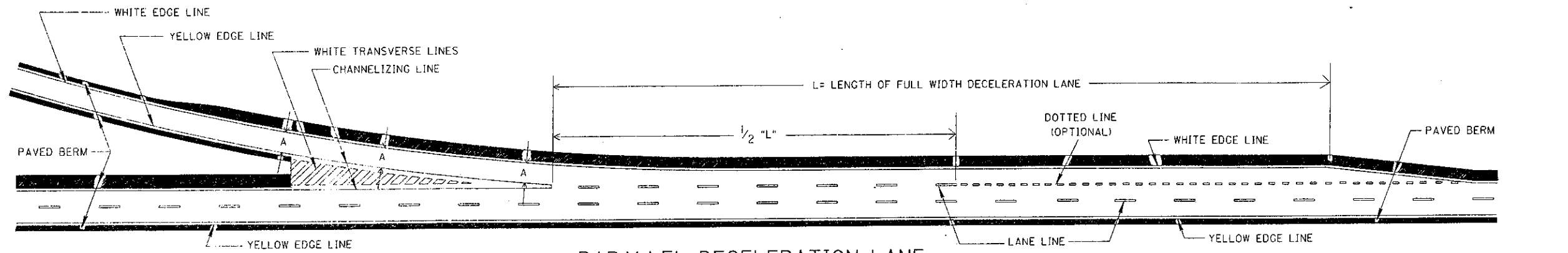
TYPE	DIMENSIONS (METERS)			
	A	B	C	D
RURAL	9 MIN.	10-25	2.5	10-25
URBAN	3 MIN.	7-18	1.8	7-18



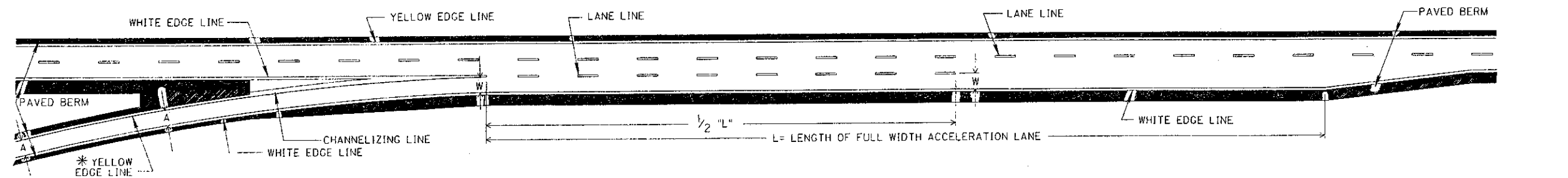
TYPE	E (MILLIMETERS)
	STANDARD
RURAL	2500
URBAN	1800



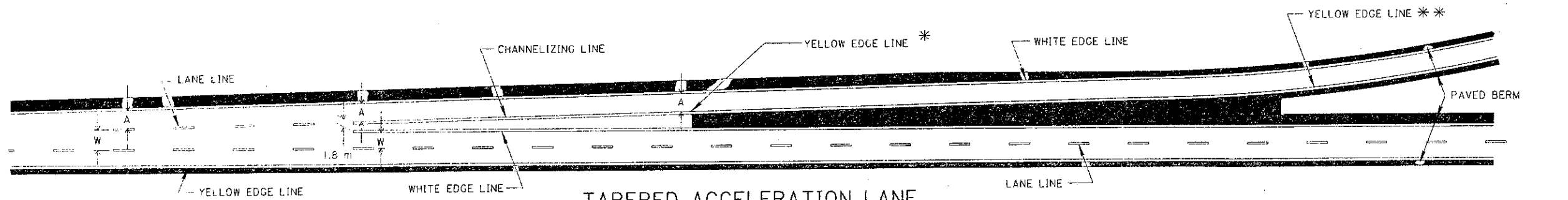
M E T R I C	
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 09/01/93
WORDS, SYMBOLS AND ARROWS	
STANDARD CONSTRUCTION DRAWING	TC-71.10M
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	



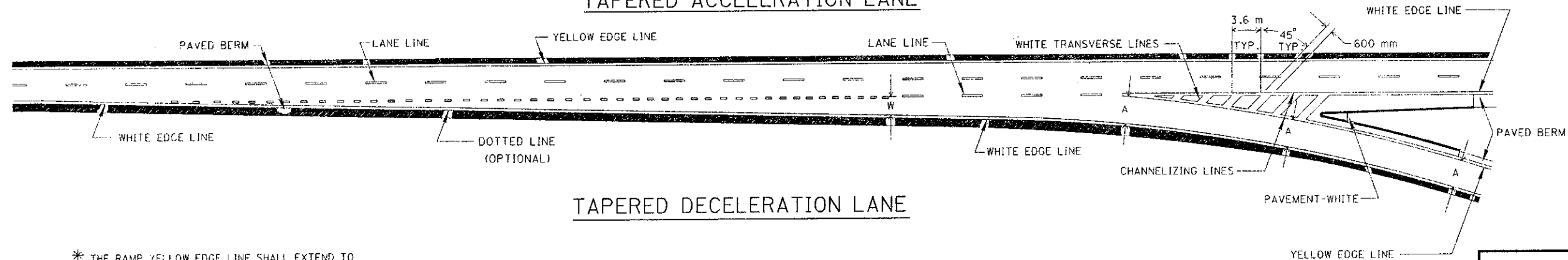
PARALLEL DECELERATION LANE



PARALLEL ACCELERATION LANE



TAPERED ACCELERATION LANE

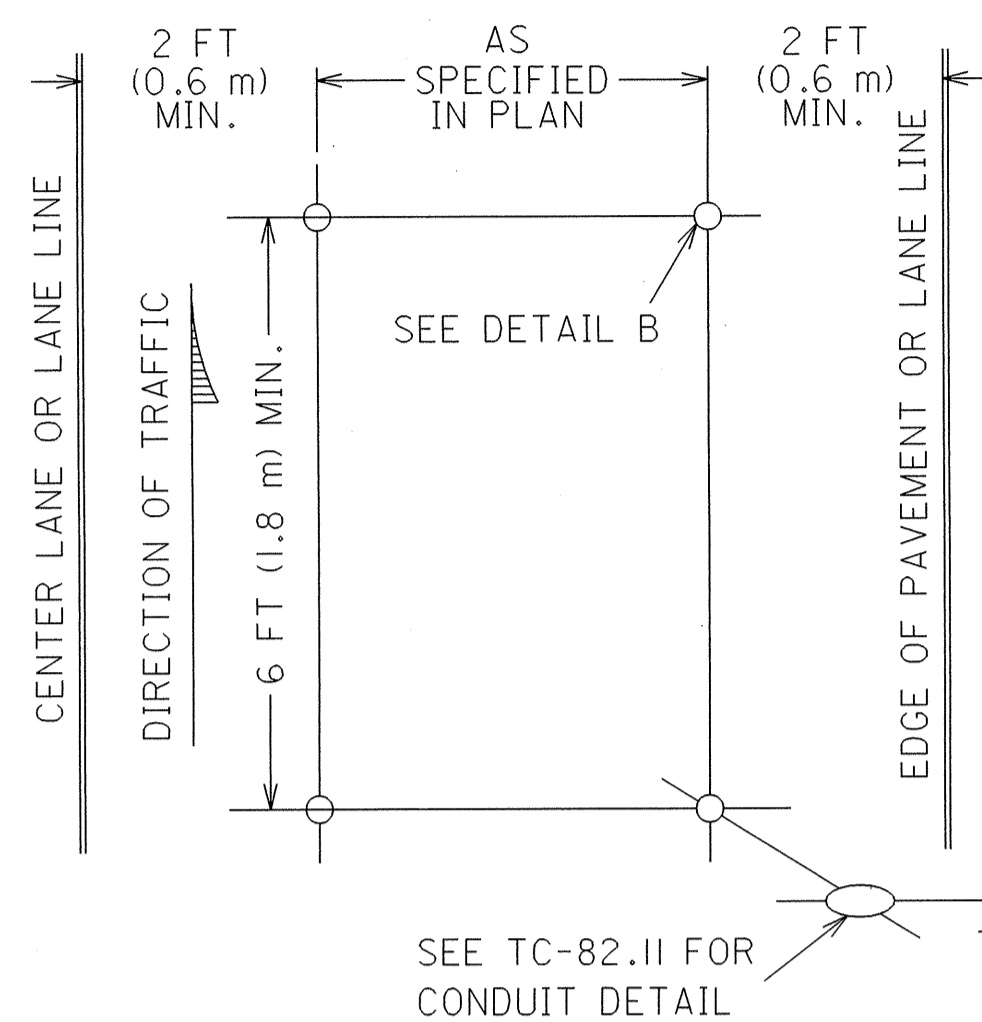


TAPERED DECELERATION LANE

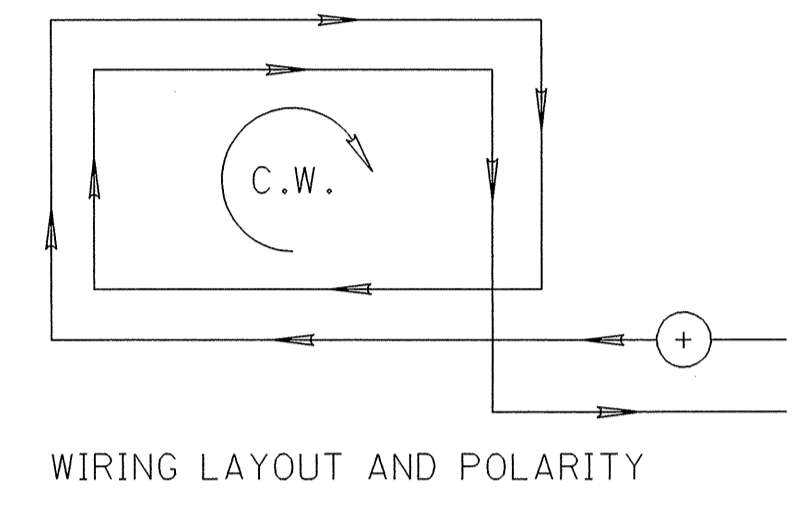
* THE RAMP YELLOW EDGE LINE SHALL EXTEND TO WHERE THE PAVED BERM ENDS.
 ** ANY EXISTING CURB SHALL BE PAINTED WHITE.
 A = UNIFORM RAMP WIDTH
 W = LANE WIDTH

M E T R I C

BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 09/01/93
FREWAY ENTRANCE AND EXIT MARKINGS	
STANDARD CONSTRUCTION DRAWING	TC-72.20M
APPROVED <i>[Signature]</i> ENGR. OF DESIGN SERVICES	



LOOP CONSTRUCTION	
LOOP PERIMETER	NUMBER OF TURNS
LESS THAN 40 FT (12 m)	4
40 FT (12 m) TO 160 FT (49 m)	3
OVER 160 FT (49 m)	2



TYPICAL DETECTOR LOOP DETAILS

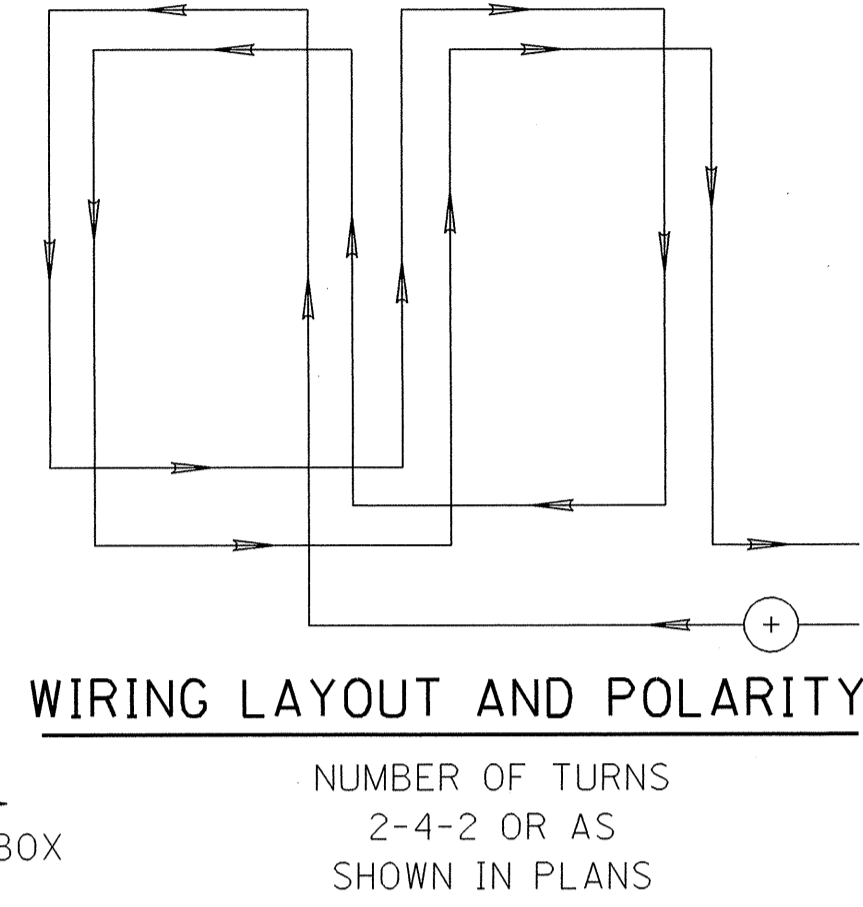
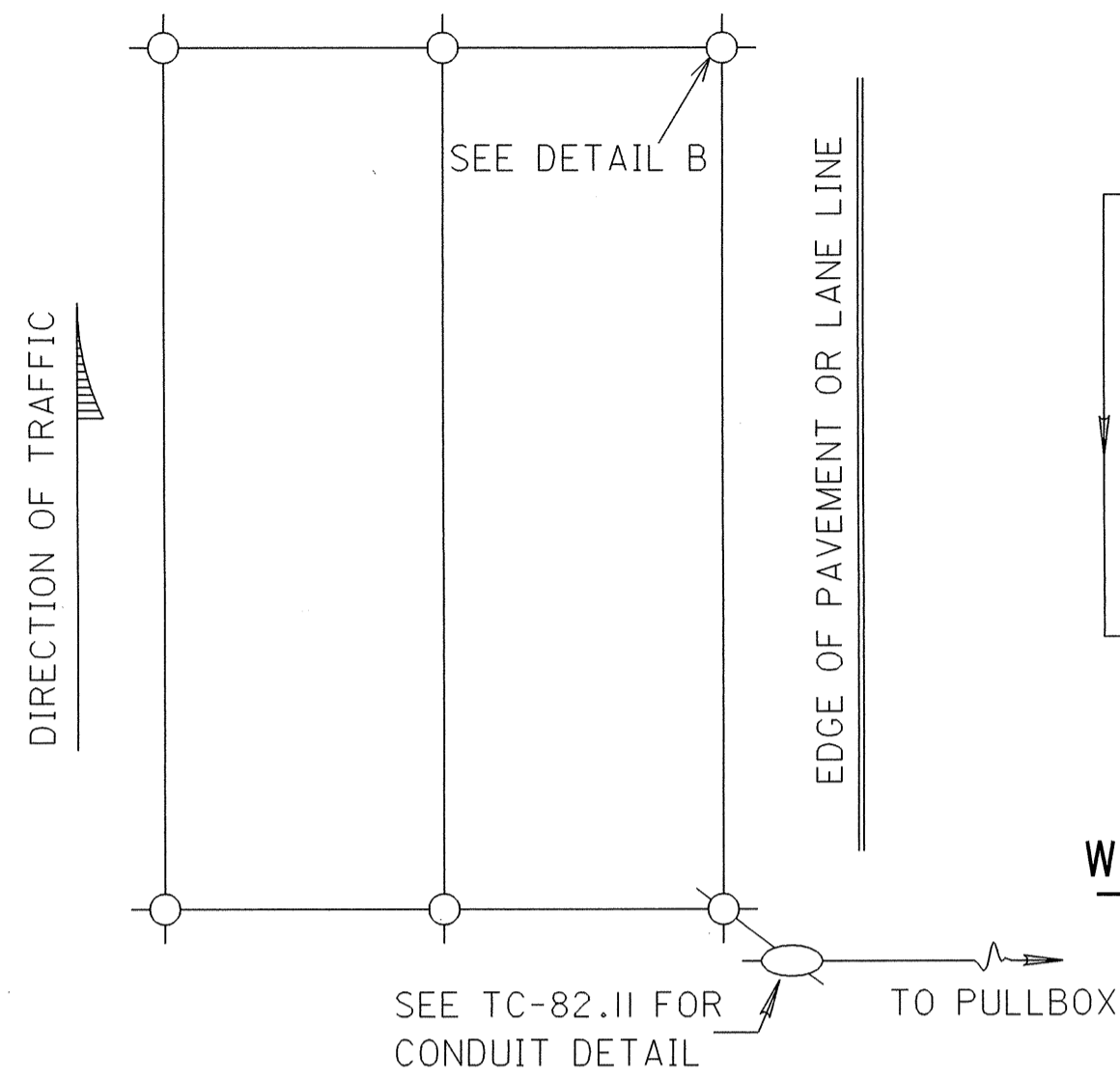
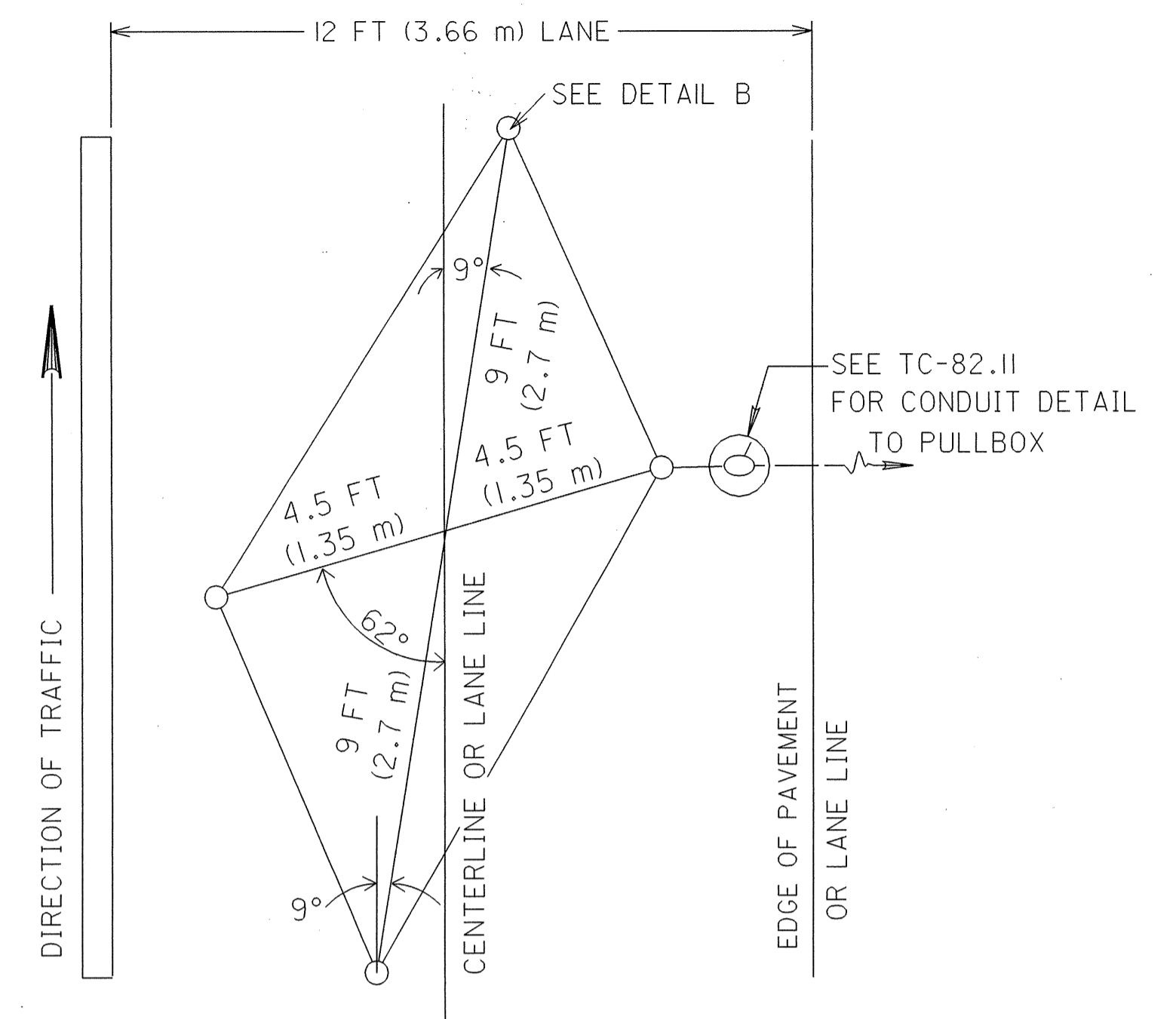
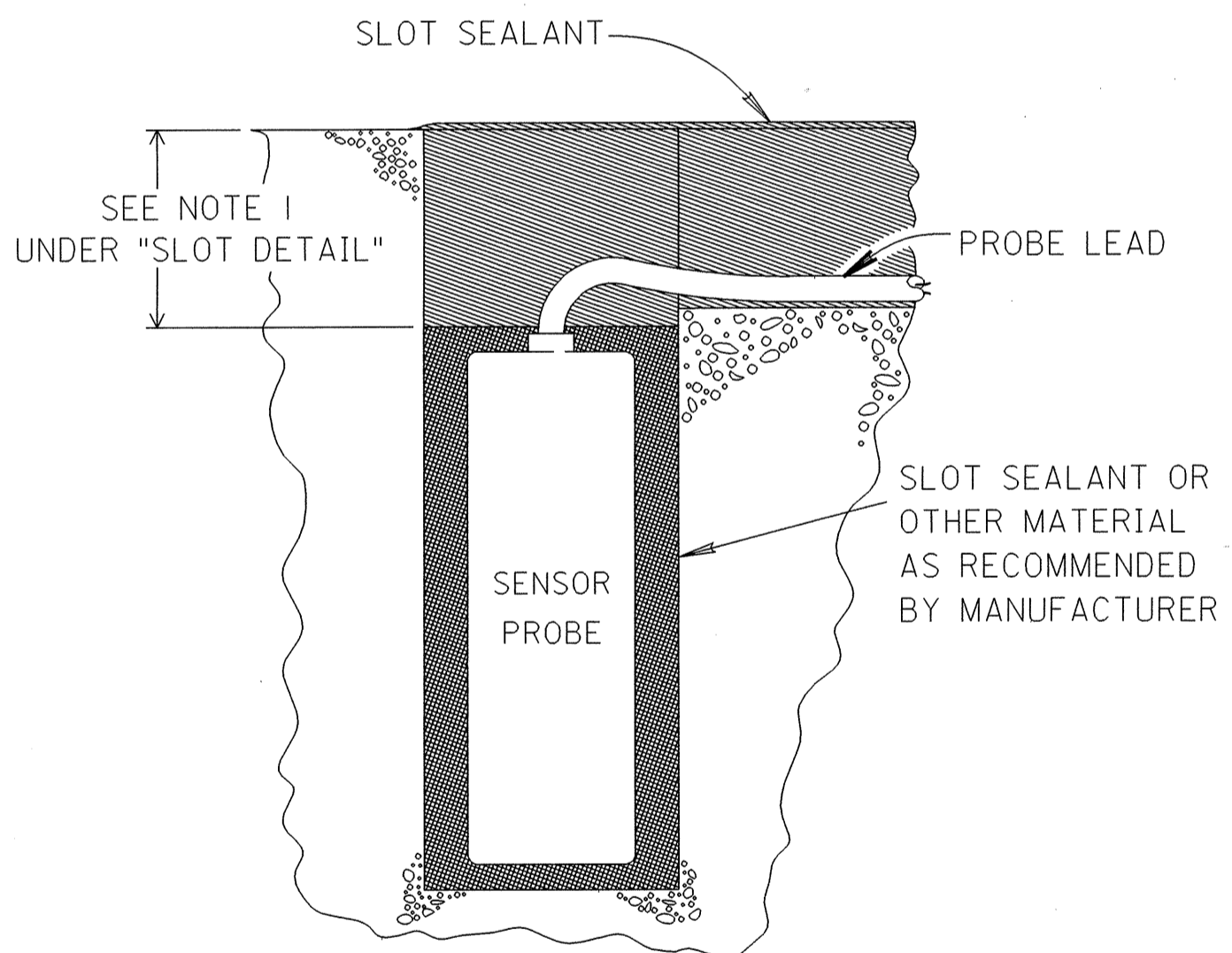


FIGURE 8 (QUADRUPOLE) LOOP DETAILS



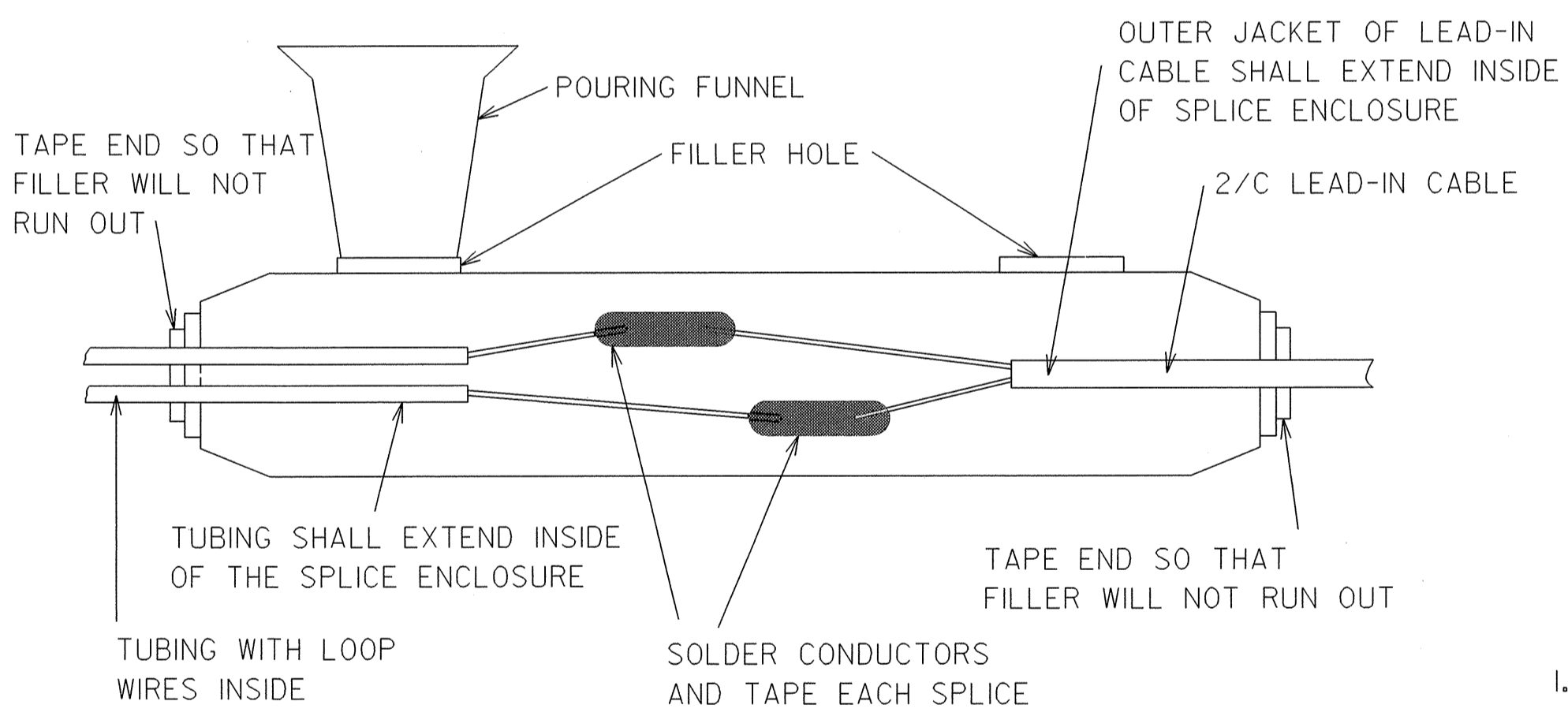
OTHER SIZES CAN BE DESIGNATED AS LONG AS THE ANGLES REMAIN THE SAME AS SHOWN AND THE DIMENSION RATIO REMAINS 2:1.

ANGULAR DESIGN DETECTION LOOP DETAIL



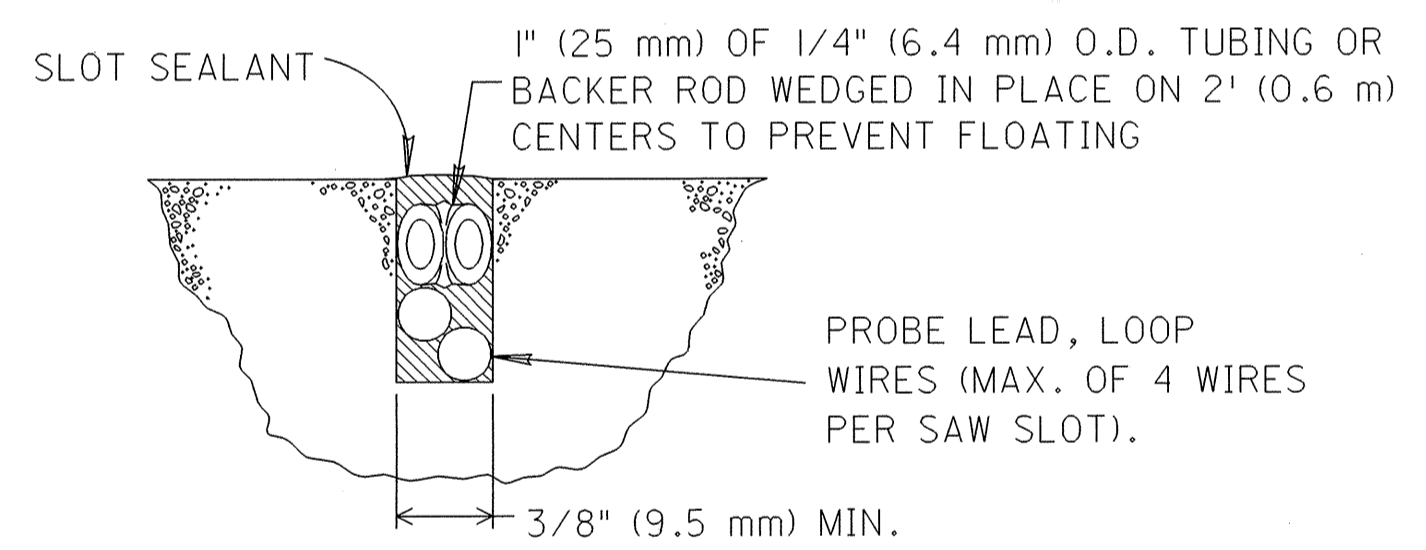
THE MAGNETOMETER HOLE SIZE SHALL BE APPROXIMATELY 3/4" (19 mm) LARGER THAN THE DETECTOR PROBE DIAMETER AND A DEPTH AS RECOMMENDED BY THE MANUFACTURER OR AS DIRECTED BY THE ENGINEER.

MAGNETOMETER SENSOR PROBE DETAIL



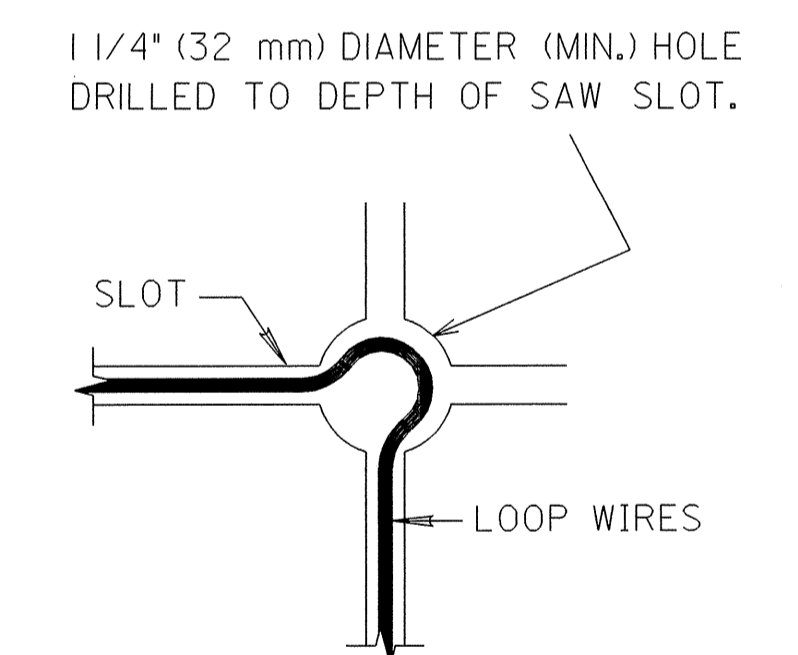
1. LOOP DETECTOR WIRE TO LEAD-IN CABLE SPLICES WITHIN THE ENCAPSULATED SPLICE ENCLOSURE SHALL BE SOLDERED.
2. IF A PULLBOX IS NOT SPECIFIED IN THE PLANS, THE WATERPROOF SPLICE ENCLOSURE SHALL BE LOCATED IN THE FIRST ENTERED POLE OR PEDESTAL, EXCEPT IF THE CONTROLLER CABINET IS MOUNTED ON THAT POLE OR PEDESTAL, IN WHICH CASE THE LOOP WIRES SHALL BE ROUTED DIRECTLY INTO THE CABINET WITHOUT SPLICING.
3. VISIBLE AIR BUBBLES (VOIDS) OF 1/4" (6 mm) OR GREATER MAY BE CAUSE FOR REJECTION OF THE SPLICE.

SPLICE ENCLOSURE DETAIL



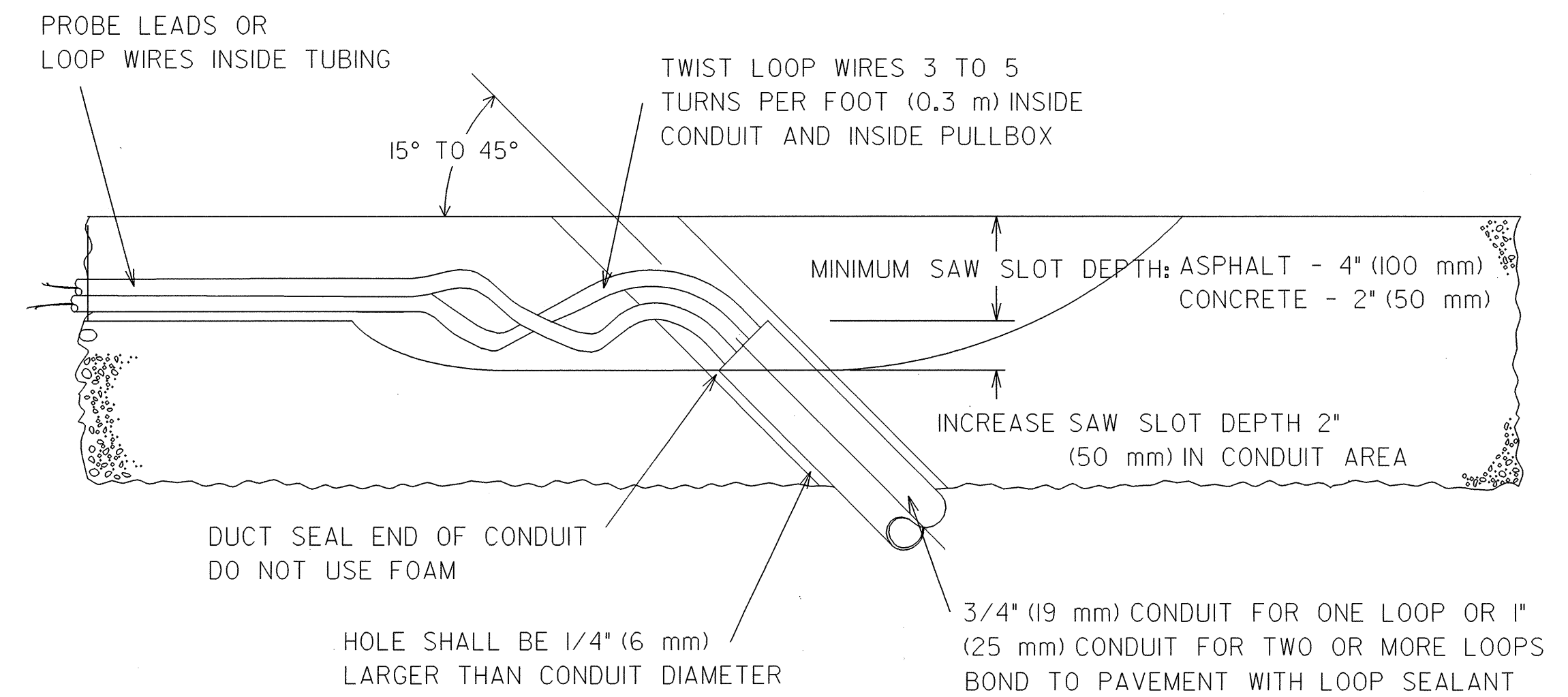
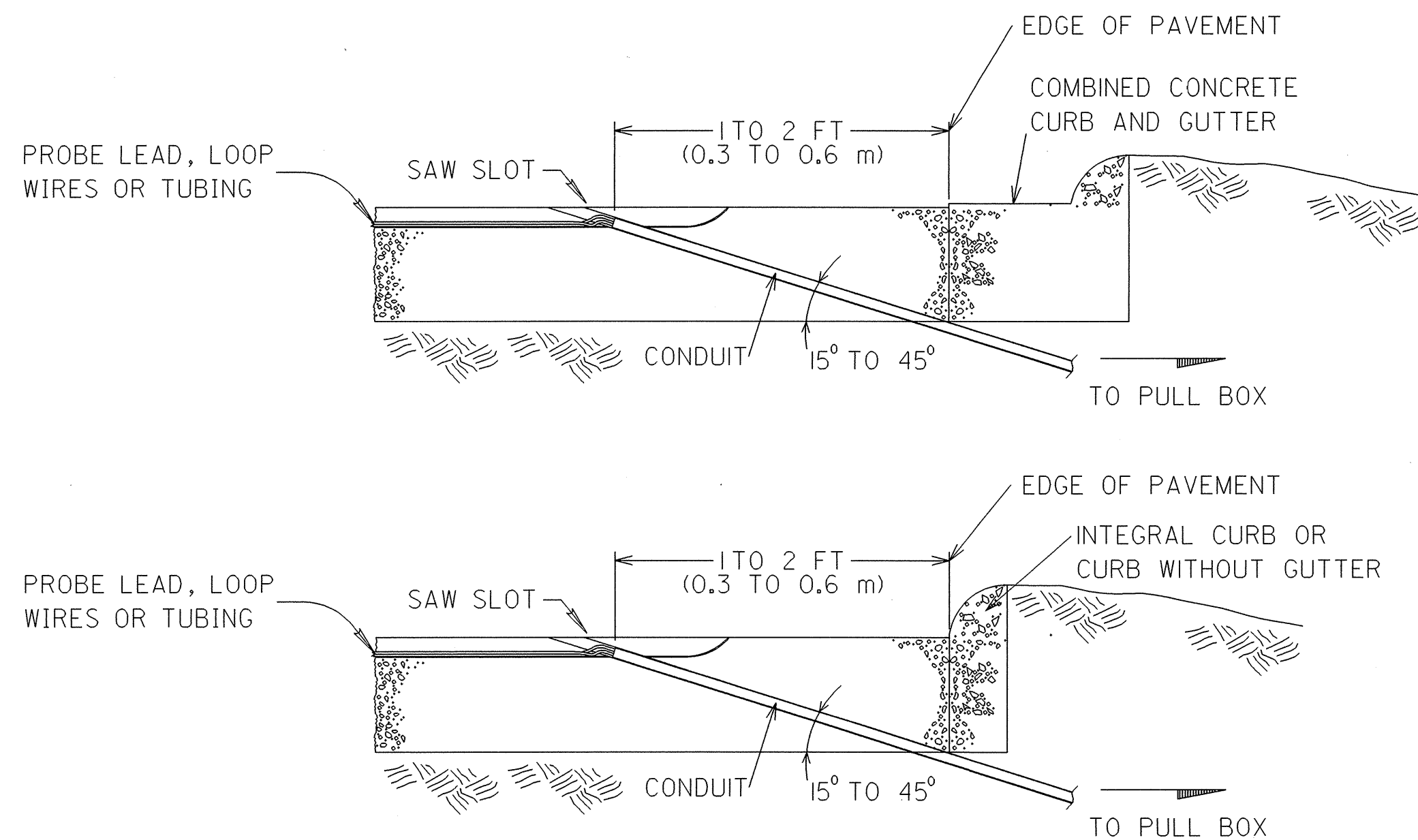
1. MINIMUM SAW SLOT DEPTH: ASPHALT 4" (100 mm), CONCRETE 2" (50 mm)
2. LOOP DETECTOR WIRE IN TUBING SHALL BE AS SPECIFIED IN CMS TABLE 732.19.
3. LOOP DETECTOR SEALANT SHALL BE A PREQUALIFIED PRODUCT IN ACCORDANCE WITH SUPPLEMENT 1048.
4. SAW SLOTS AND PROBE HOLES SHALL BE THOROUGHLY CLEANED AND DRIED PRIOR TO INSTALLATION OF SEALANT.
5. WIRE INSTALLATIONS IN NEW ASPHALT MAY BE SAWS AND EMBEDDED WITH SEALANT IN A SUB-SURFACE COURSE WITH SUBSEQUENT COVERING BY THE SURFACE COURSE, IF SPECIFIED IN PLAN.

SLOT DETAIL

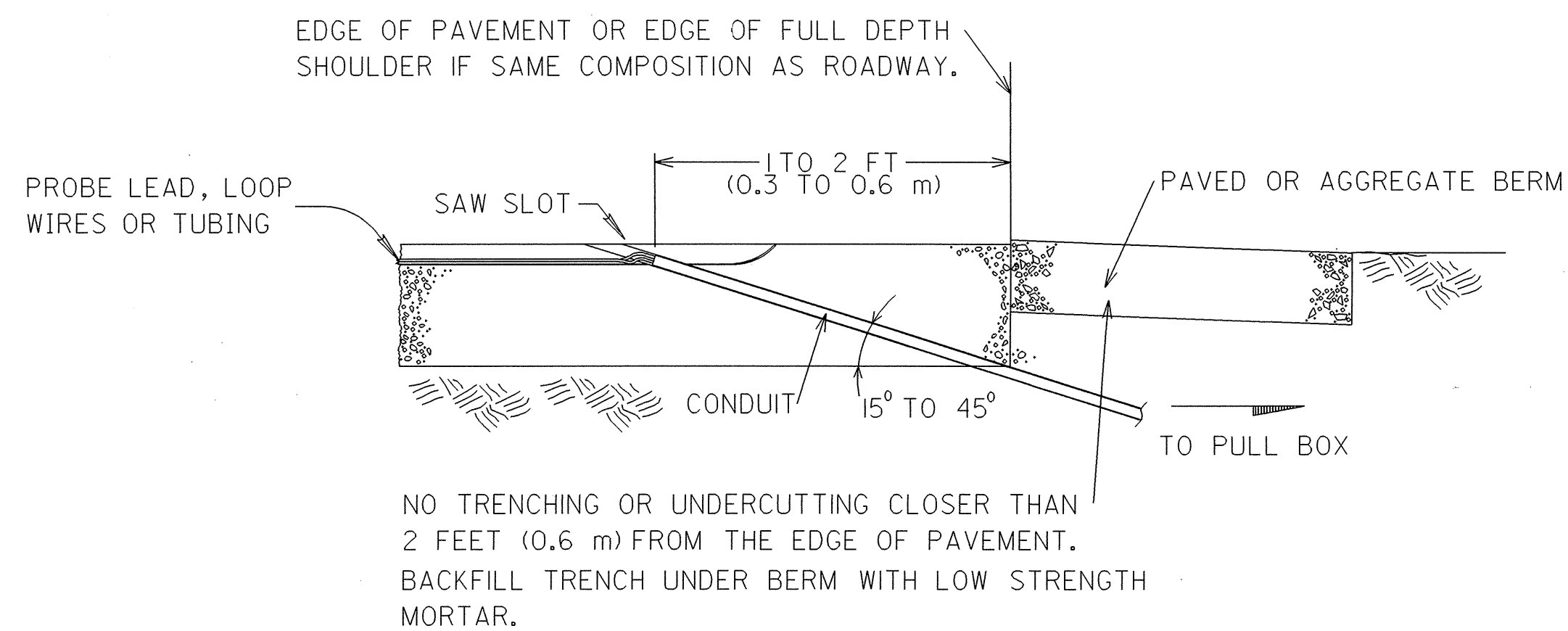


DETAIL B

OFFICE OF TRAFFIC ENGINEERING DIVISION OF ENGINEERING POLICY OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 01/19/99
VEHICLE DETECTOR INSTALLATION DETAILS I	
STANDARD CONSTRUCTION DRAWING	TC-82.10
APPROVED <i>[Signature]</i>	ADMINISTRATOR

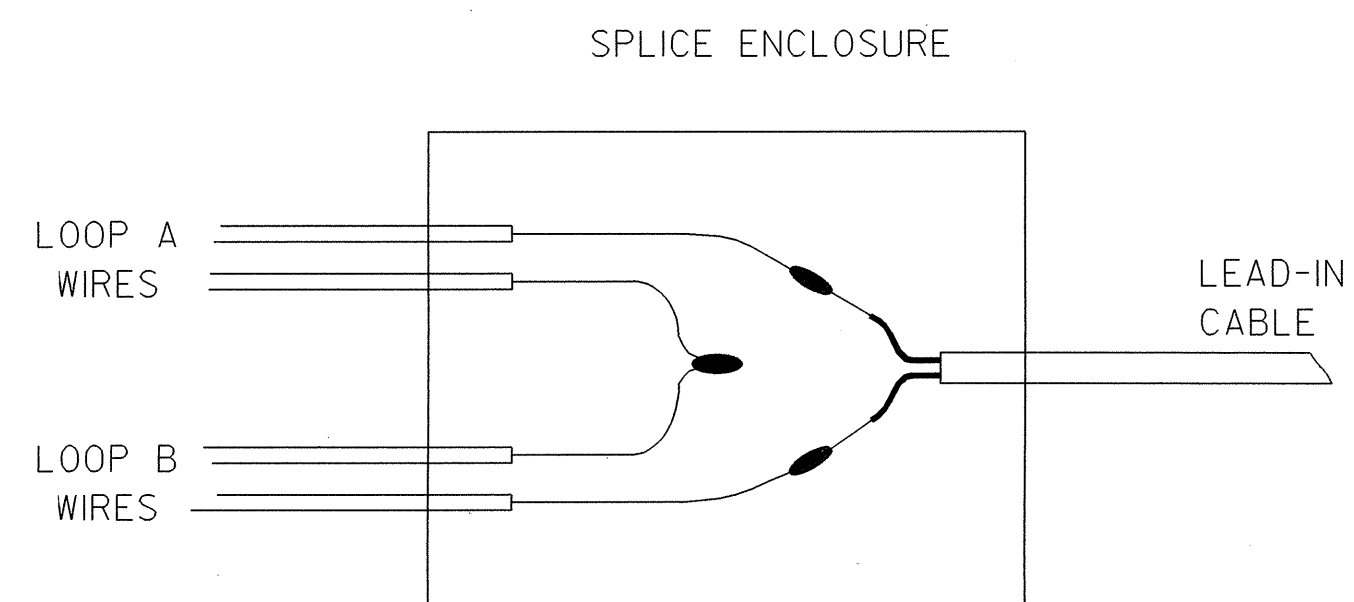


CONDUIT DRILLED HOLE DETAIL



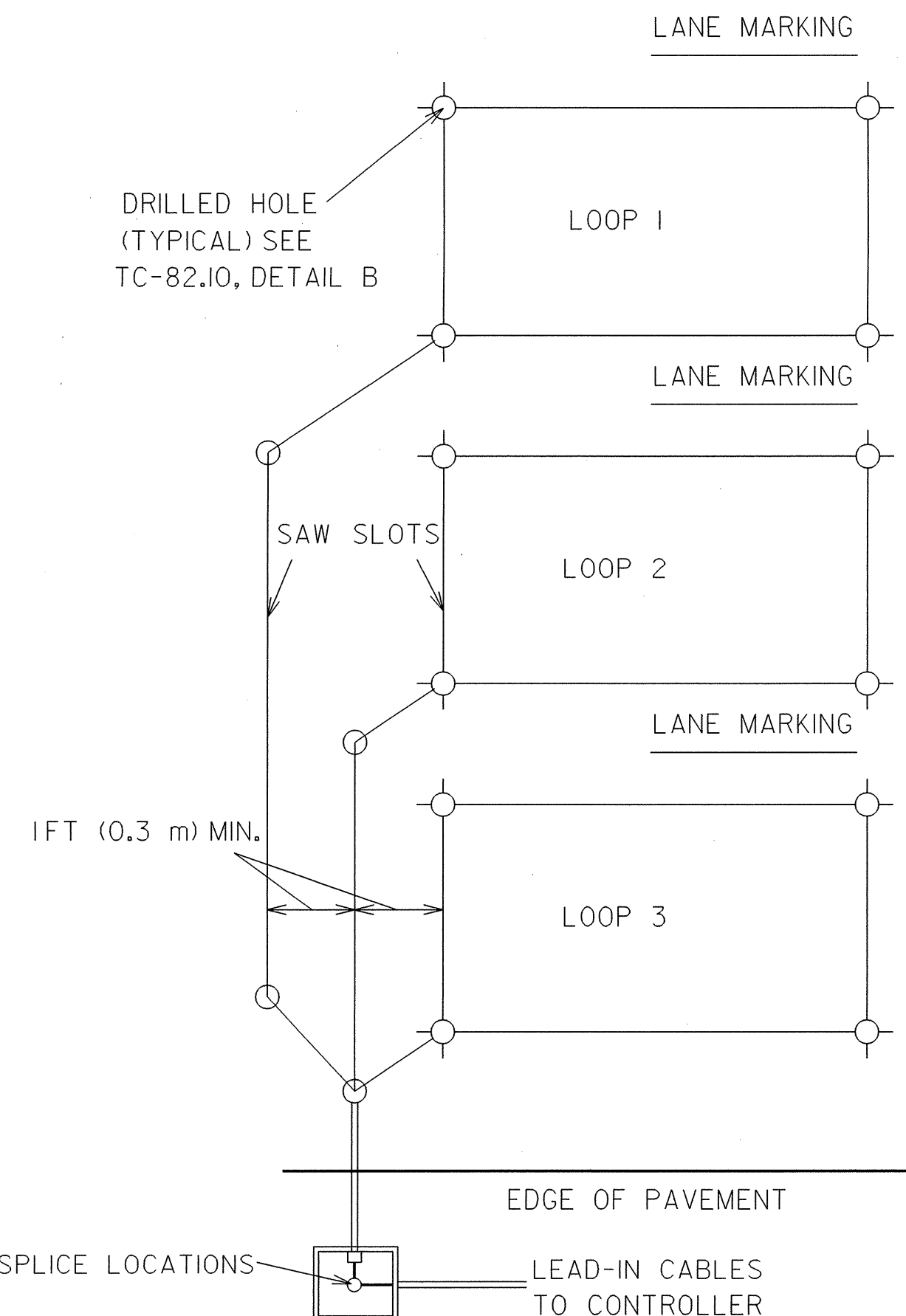
- NO TRENCHING OR UNDERCUTTING CLOSER THAN 2 FEET (0.6 m) FROM THE EDGE OF PAVEMENT. BACKFILL TRENCH UNDER BERM WITH LOW STRENGTH MORTAR.
1. THE DRILLED HOLE SHALL BE LOCATED AS SHOWN ABOVE AND WITHIN THE FULL DEPTH PAVEMENT. IT SHALL NOT BE DRILLED OR CUT THROUGH THE PAVED BERM, CURB OR CURB AND GUTTER SECTION.
 2. IN AREAS OF POOR PAVEMENT CONDITION, THE SAW SLOT DEPTH SHALL BE INCREASED TO INSURE ADEQUATE WIRE EMBEDMENT. ALL FIELD ADJUSTMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

TYPICAL DRILLED HOLE LOCATIONS



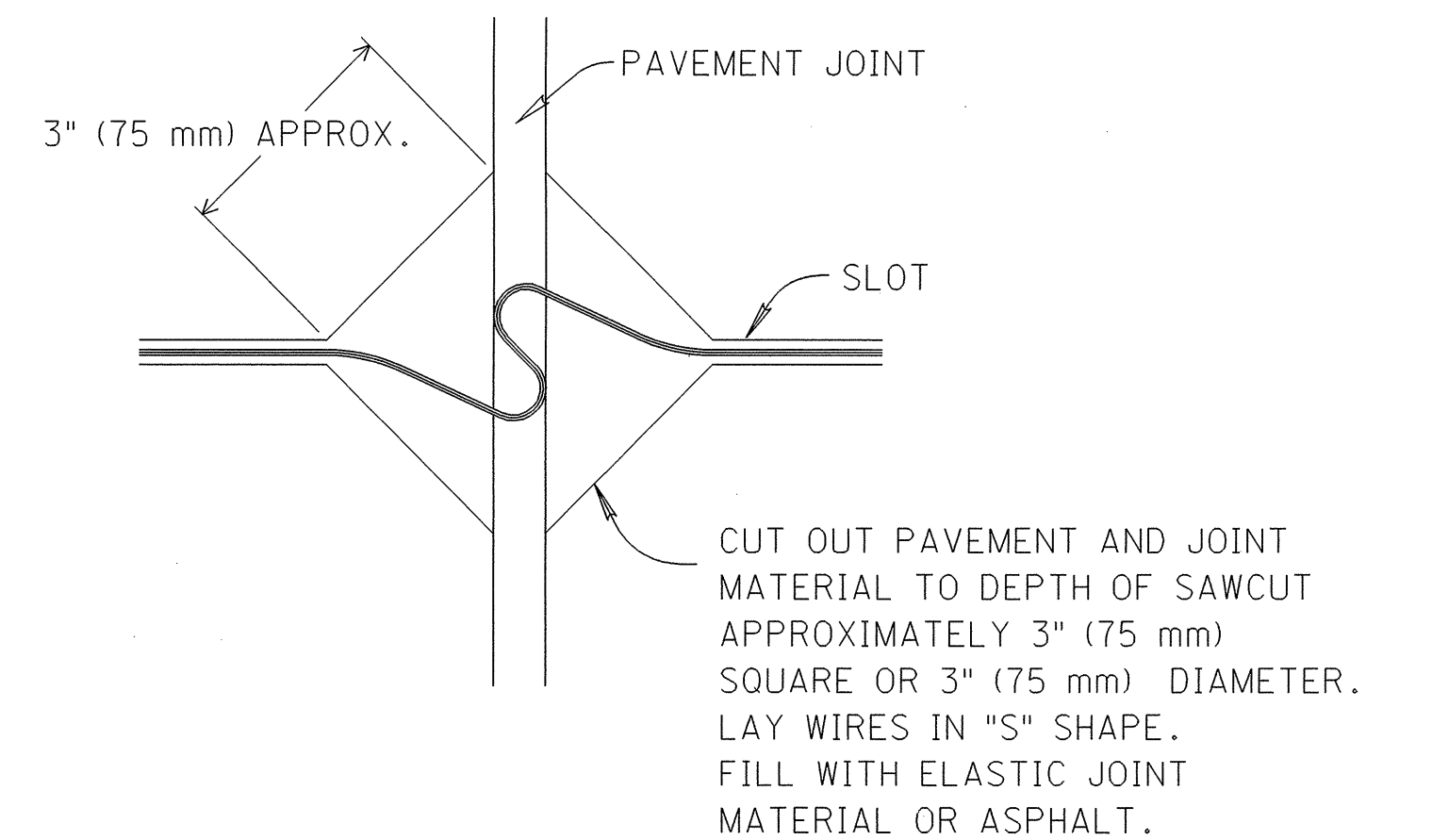
SERIES CONNECTIONS

1. WHERE MULTIPLE LOOPS USE A SINGLE LEAD-IN CABLE, SERIES CONNECTIONS SHALL BE USED.
2. A MAXIMUM OF 2 LOOPS (3 WIRE SPLICES) SHALL BE USED IN ANY ENCAPSULATED SPLICE KIT.



1. ONLY ONE SET OF LOOP WIRES SHALL BE RUN IN A SAW SLOT OVER TO THE CONDUIT HOLE LOCATION.
2. ALL ADJACENT SAW SLOTS SHALL HAVE A MINIMUM DISTANCE OF 1 FOOT (0.3 m) BETWEEN THEM. NO SAW SLOT SHALL BE LOCATED WITHIN 1 FOOT (0.3 m) OF A LONGITUDINAL OR TRANSVERSE JOINT IN P.C.C. PAVEMENTS IF THE SLOT IS PARALLEL TO THE JOINT.

MULTIPLE LOOP LAYOUT



JOINT CROSSING DETAIL IN P.C.C. PAVEMENTS

OFFICE OF TRAFFIC ENGINEERING DIVISION OF ENGINEERING POLICY OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 01/19/99
VEHICLE DETECTOR INSTALLATION DETAILS II	
STANDARD CONSTRUCTION DRAWING	TC-82.11
APPROVED <i>[Signature]</i>	ADMINISTRATOR